



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

ASSOCIATION INTERNATIONALE pour  
L'EVALUATION DU RENDEMENT SCOLAIRE

SECOND

Study of

MATHEMATICS



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**HONG KONG - POPULATION A  
INSTRUMENTS**

**COLLEGE OF EDUCATION  
UNIVERSITY OF ILLINOIS AT URBANA - CHAMPAIGN  
1989**



IEA  
SECOND INTERNATIONAL MATHEMATICS STUDY  
NATIONAL RESEARCH COORDINATORS REPORT  
HONG KONG  
Part 2: Cognitive Instruments



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H757

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INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 2

MATHEMATICS CORE TEST

FORM 1/MIDDLE 1 classes

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81



# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an inter-national test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more familiar. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

☒ A ☐ B ☐ C ☐ D ☐ E  
 Calculator used? ☒ Yes ☐ No  
 有使用計算機嗎? 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的, 所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的问题。然後, 如果你有時間, 你可以再答你留空了的问题。
2. 在整個測驗中, 請用 '粗' 的 HB 鉛筆作答。
3. 在答案紙的頂端, 請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

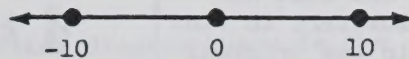
正確的答案是 A。

假如你用了計算機作答, 你須將答案空格如下填上

☒ A ☐ B ☐ C ☐ D ☐ E  
 Calculator used? ☒ Yes ☐ No  
 有使用計算機嗎? 有 沒有



1.



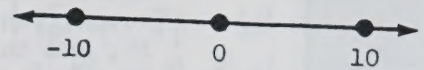
Which of the following sequences of numbers is in the order in which they occur from left to right on the number line?

- A  $0, \frac{1}{2}, -1$
- B  $0, -1, \frac{1}{2}$
- C  $-1, -\frac{1}{2}, 0$
- D  $-1, 0, -\frac{1}{2}$
- E  $-\frac{1}{2}, -1, 0$

Calculator used?

Yes / No

1.



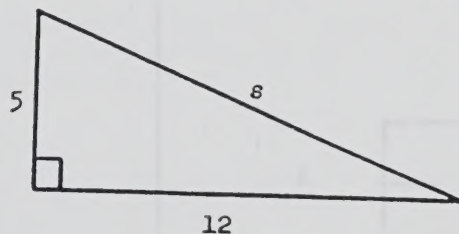
下面那一組數列在數軸裏是從左到右的？

- A  $0, \frac{1}{2}, -1$
- B  $0, -1, \frac{1}{2}$
- C  $-1, -\frac{1}{2}, 0$
- D  $-1, 0, -\frac{1}{2}$
- E  $-\frac{1}{2}, -1, 0$

有用計算機嗎？

有/沒有

2.



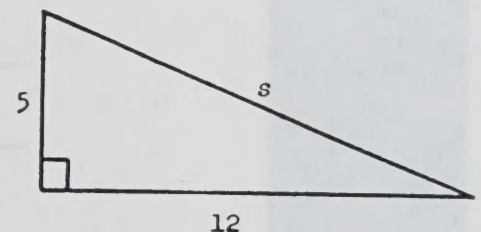
What is the value of  $s$ ?

- A 7
- B 13
- C 15
- D 17
- E None of these

Calculator used?

Yes / No

2.



$s$  之值為何？

- A 7
- B 13
- C 15
- D 17
- E 以上皆不對

有用計算機嗎？

有/沒有



3.

Alexandra walked from Riverview to Bridgeport, which are 3.1 kilometers apart. During her walk she lost her watch, went back 1.7 kilometers to find it, and then continued in the original direction until she reached Bridgeport. How many kilometers had Alexandra walked altogether when she arrived at Bridgeport?

- A 1.4
- B 4.8
- C 6.5
- D 8.2
- E None of these

Calculator used? Yes / No

3

3.

阿歷仙地從R城步行到B城。兩城相距3.1千米。途中她遺失了手錶，於是她回頭行1.7千米才把它找回。之後她繼續向原來方向進發直至抵達B城。問她總共行了若干千米。

- A 1.4
- B 4.8
- C 6.5
- D 8.2
- E 以上皆不對

有用計算機嗎？ 有/沒有

4.

$(-2) \times (-3)$  is equal to

- A -6
- B -5
- C -1
- D 5
- E 6

Calculator used? Yes / No

4.

$(-2) \times (-3)$  等於

- A -6
- B -5
- C -1
- D 5
- E 6

有用計算機嗎？ 有/沒有

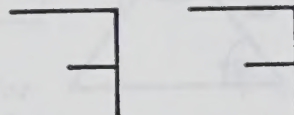


到B城。  
 中她  
 回頭行了  
 後她  
 直至抵  
 行了若干千米？

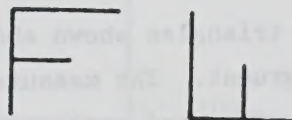
5.

In which diagram below is the second figure the image of the first figure under a reflection in a line?

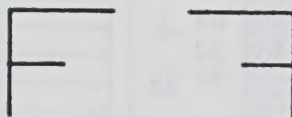
A



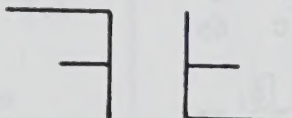
B



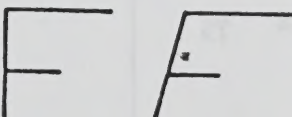
C



D



E



4

5.

下列圖中,那一組的第二個圖形是第一個圖形沿一直線反射所得的映像?

有/沒有

Calculator used?

Yes / No

有用計算機嗎?

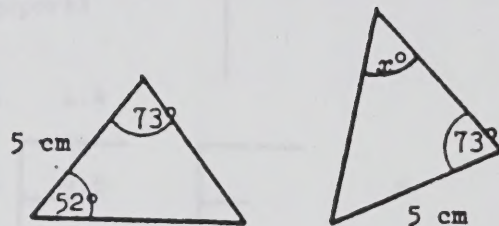
有/沒有

有/沒有

CORE



6.



The triangles shown above are congruent. The measures of some of the sides and angles are as shown.

What is  $x$ ?

A 52

B 55

C 65

D 73

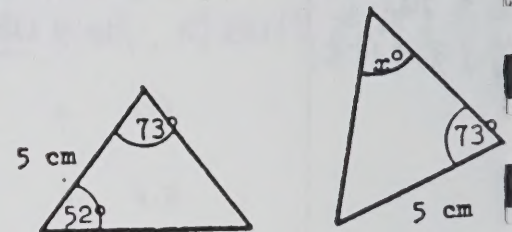
E 75

Calculator used?

Yes / No

5

6.



上圖所示兩個三角形全等  
某些邊和角的值如圖所示  
問  $x$  為何?

A 52

B 55

C 65

D 73

E 75

有用計算機嗎?

有/沒有

CORE

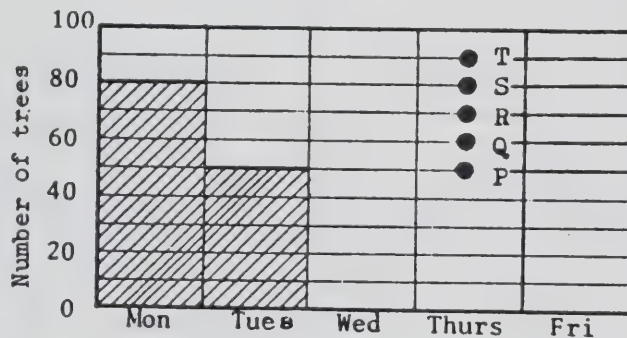


7.

Here is a table that shows the number of trees planted along a highway in a week.

Days of the Week	Mon	Tues	Wed	Thurs	Fri
Number of Trees Planted	80	50	60	90	75

On the diagram below the graph for the first two days' plantings has been drawn.



If the graph were completed, which point would indicate the top of the bar on 'Thursday'?

- A P  
B Q  
C R  
D S  
E T

Calculator used?

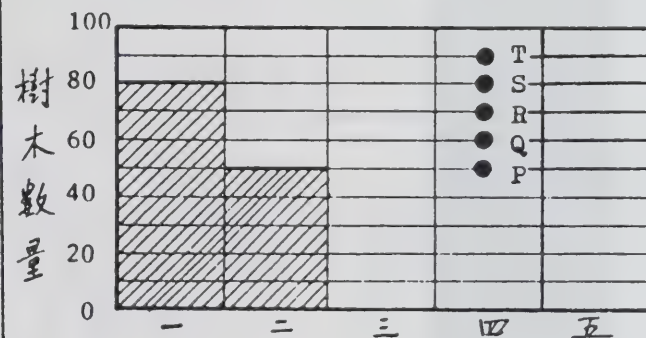
Yes / No

7.

下表列了在一星期內沿一公路植樹的數目。

星期	一	二	三	四	五
植樹數目	80	50	60	90	75

下圖顯示首兩天植樹的數量。



圖表完成後,那一點會表示星期四植樹柱的頂點?

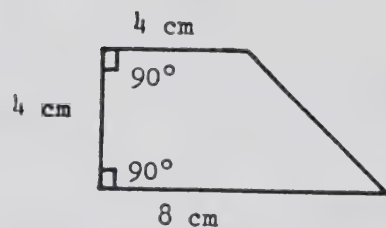
- A P  
B Q  
C R  
D S  
E T

有用計算機嗎?

有/沒有



8.



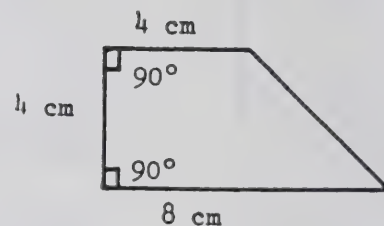
There is a brass plate of the shape and dimensions shown in the figure above. What is its area in square centimeters?

- A 16
- B 24
- C 32
- D 64
- E 96

Calculator used?

Yes / No

8.



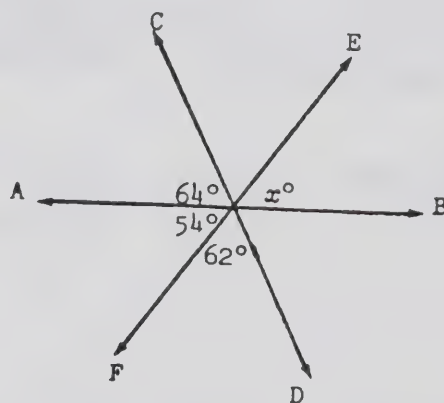
上圖顯示一塊銅板的形狀和大小。以平方厘米計，它的面積是多少？

- A 16
- B 24
- C 32
- D 64
- E 96

有用計算機嗎？

有/沒有

9.



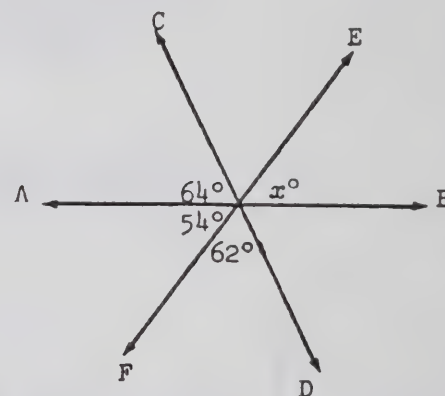
AB, CD, and EF are intersecting straight lines as shown above. The measures of certain angles are shown.  $x$  is equal to

- A 54
- B 62
- C 64
- D 126
- E 128

Calculator used?

Yes / No

9.



如上圖所示，AB, CD, 及 EF 是相交的直線。某些角的大小也如圖示。 $x$  等於

- A 54
- B 62
- C 64
- D 126
- E 128

有用計算機嗎？

有/沒有



10.

Simplify:  $5x + 3y + 2x - 4y$ 

A  $7x + 7y$

B  $8x - 2y$

C  $6xy$

D  $7x - y$

E  $7x + y$

Calculator used?

Yes / No

11.

What is the volume of a rectangular box with interior dimensions 10 cm long, 10 cm wide, and 7 cm high?

A  $27 \text{ cm}^3$

B  $70 \text{ cm}^3$

C  $140 \text{ cm}^3$

D  $280 \text{ cm}^3$

E  $700 \text{ cm}^3$

Calculator used?

Yes / No

10.

化簡:  $5x + 3y + 2x - 4y$ 

A  $7x + 7y$

B  $8x - 2y$

C  $6xy$

D  $7x - y$

E  $7x + y$

有用計算機嗎?

有/沒有

11.

一個長方盒內部長 10 cm, 闊 10 cm, 高 7 cm. 它的體積是多少?

A  $27 \text{ cm}^3$

B  $70 \text{ cm}^3$

C  $140 \text{ cm}^3$

D  $280 \text{ cm}^3$

E  $700 \text{ cm}^3$

有用計算機嗎?

有/沒有



12.

If  $P = LW$  and if  $P = 12$  and  $L = 3$ , then  $W$  is equal to

- A  $\frac{3}{4}$   
 B 3  
 C 4  
 D 12  
 E 36

Calculator used?

Yes / No

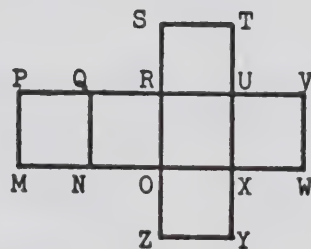
12.

設  $P = LW$ 。如果  $P = 12$  及  $L = 3$ ，那麼  $W$  等於

- A  $\frac{3}{4}$   
 B 3  
 C 4  
 D 12  
 E 36

有用計算機嗎？ 有 / 沒有

13.



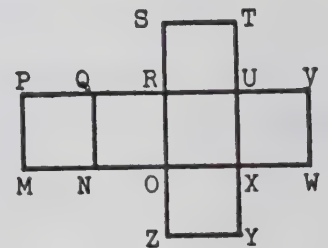
The diagram shows a cardboard cube which has been cut along some edges and folded out flat. If it is folded to again make the cube, which two corners will touch corner P?

- A corners Q and S  
 B corners T and Y  
 C corners W and Y  
 D corners T and V  
 E corners U and Y

Calculator used?

Yes / No

13.



上圖顯示一個用卡紙造的立方體，沿某些邊剪開。如果現在要重新摺起回復原狀，那麼哪兩個角會連接 P?

- A 角 Q 及 S  
 B 角 T 及 Y  
 C 角 W 及 Y  
 D 角 T 及 V  
 E 角 U 及 Y

有用計算機嗎？ 有 / 沒有



14.

Which of the following is a pair of equivalent fractions?

A  $\frac{5}{8}$  and  $\frac{2}{3}$

B  $\frac{5}{6}$  and  $\frac{2}{3}$

C  $\frac{4}{5}$  and  $\frac{14}{15}$

D  $\frac{3}{5}$  and  $\frac{9}{15}$

E  $\frac{1}{2}$  and  $\frac{14}{24}$

Calculator used?

Yes / No

14.

下列那一對分數是全等的?

A  $\frac{5}{8}$  及  $\frac{2}{3}$

B  $\frac{5}{6}$  及  $\frac{2}{3}$

C  $\frac{4}{5}$  及  $\frac{14}{15}$

D  $\frac{3}{5}$  及  $\frac{9}{15}$

E  $\frac{1}{2}$  及  $\frac{14}{24}$

有用計算機嗎?

有/沒有

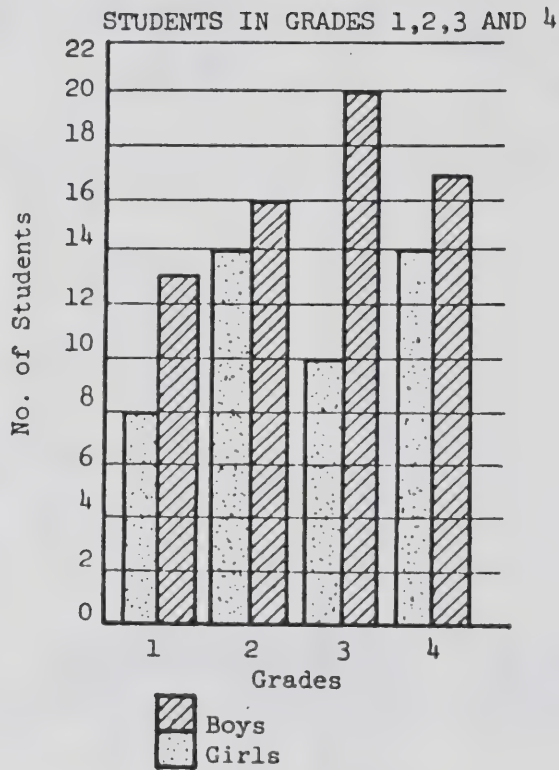
CORE

造的立  
如果現在  
狀,那兩

有/沒有



15.



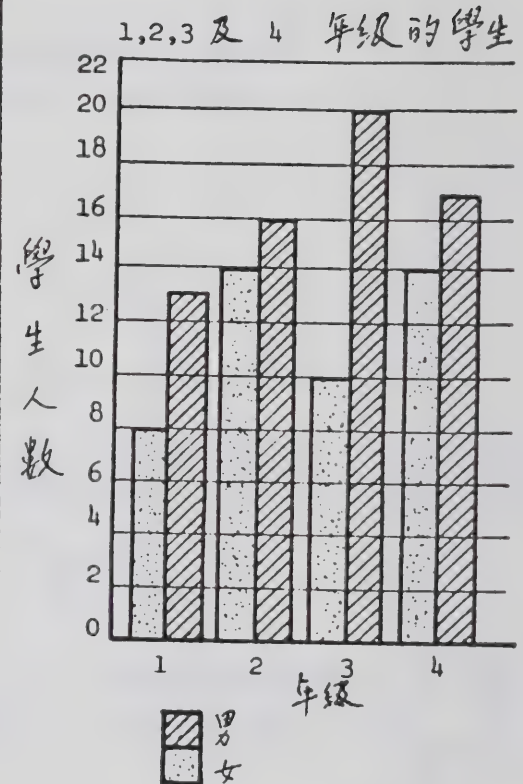
Which of these is a TRUE statement about the information shown on the graph?

- A Grade 2 is the smallest class
- B Grades 2 and 4 have the same number of students
- C Grade 3 has twice as many boys as girls
- D Grade 4 has more girls than boys
- E Grade 1 has as many boys as there are girls in Grade 4

Calculator used?

Yes / No

15.



下列那一句子正確敘述  
上圖所載之資料?

- A 二年級人數最少
- B 二年級與四年級人數相同。
- C 三年級的男生人數是女生的兩倍
- D 四年級女生比男生多
- E 一年級的男生人數等於四年級的女生人數

有用計算機嗎?

有/沒有



16.

$$Q = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$R = \{3, 5, 7, 9, 11, 13\}$$

$$S = Q \cap R$$

There are 9 elements in set Q and 6 in set R. How many elements are there in set S?

A 16

B 11

C 7

D 4

E 2

Calculator used?

Yes / No

16.

$$Q = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$R = \{3, 5, 7, 9, 11, 13\}$$

$$S = Q \cap R$$

Q 集有 9 個元素而 R 集有 6 個元素。S 集有多少個元素?

A 16

B 11

C 7

D 4

E 2

有用計算機嗎?

有/沒有

17.

$$\frac{2}{5} + \frac{3}{8} \text{ is equal to}$$

A  $\frac{5}{13}$

B  $\frac{5}{40}$

C  $\frac{6}{40}$

D  $\frac{16}{15}$

E  $\frac{31}{40}$

Calculator used?

Yes / No

17.

$$\frac{2}{5} + \frac{3}{8} \text{ 等於}$$

A  $\frac{5}{13}$

B  $\frac{5}{40}$

C  $\frac{6}{40}$

D  $\frac{16}{15}$

E  $\frac{31}{40}$

有用計算機嗎?

有/沒有



18.

$0.40 \times 6.38$  is equal to

A .2552

B 2.452

C 2.552

D 24.52

E 25.52

Calculator used?

Yes / No

18.

$0.40 \times 6.38$  等於

A .2552

B 2.452

C 2.552

D 24.52

E 25.52

有用計算機嗎?

有/沒

19.

On level ground, a boy 5 units tall casts a shadow 3 units long. At the same time a nearby telephone pole 45 units high casts a shadow the length of which, in the same units, is

A 24

B 27

C 30

D 60

E 75

Calculator used?

Yes / No

19.

在平地，一高 5 單位的男童投下一個 3 單位長的影子。同時間鄰近有一個 45 單位高的電話竿，如用同樣單位去量度，它所投影子的長度是

A 24

B 27

C 30

D 60

E 75

有用計算機嗎?

有/沒



20.

$(22 \times 18) - (47 + 59)$  is  
equal to

- A 290  
B 300  
C 384  
D 408  
E 502

Calculator used?

Yes / No

有/沒有

20.

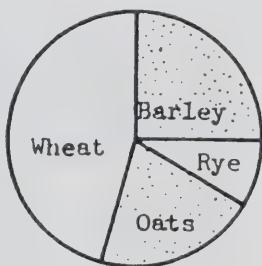
$(22 \times 18) - (47 + 59)$  等於

- A 290  
B 300  
C 384  
D 408  
E 502

有用計算機嗎?

有/沒有

21.



The circle graph shows the proportions of various grain crops produced by a country. Which of the following statements is TRUE?

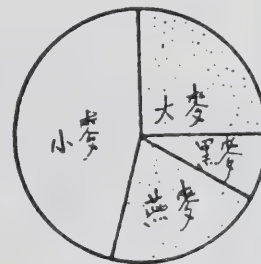
- A More oats than rye is produced.  
B The largest crop is barley  
C Equal quantities of wheat and barley are produced  
D The smallest crop is oats  
E Wheat and oats together make up less than half the total grain crop.

Calculator used?

Yes / No

有/沒有

21.



圓形圖顯示一個國家各類穀物收成的比例。下列那一句子是真實的?

- A 燕麥的產量比黑麥多  
B 收成最多的是大麥  
C 大麥與小麥的產量相等  
D 收成最少的是燕麥  
E 小麥與燕麥的產量比總收成的一半還少

有用計算機嗎? 有/沒有

22.

$$\text{If } 6x - 3 = 15$$

$$\text{then } 6x = 15 - 3 \quad (\text{i})$$

$$\text{and } 6x = 12 \quad (\text{ii})$$

$$\text{and } x = \frac{12}{6} \quad (\text{iii})$$

$$\text{and } x = 2 \quad (\text{iv})$$

The error in the above reasoning, if one exists, FIRST APPEARS in line

- A (i)  
B (ii)  
C (iii)  
D (iv)  
E None of these, there is no error.

Calculator used? Yes / No

23.

The value of  $2^3 \times 3^2$  is

- A 30  
B 36  
C 64  
D 72  
E None of these

Calculator used? Yes / No

22.

$$\text{若 } 6x - 3 = 15$$

$$\text{則 } 6x = 15 - 3 \quad (\text{i})$$

$$\text{及 } 6x = 12 \quad (\text{ii})$$

$$\text{及 } x = \frac{12}{6} \quad (\text{iii})$$

$$\text{及 } x = 2 \quad (\text{iv})$$

如果上述推理有錯的話，  
那末錯誤第一次在那行出現？

A (i)

B (ii)

C (iii)

D (iv)

E 以上皆非，推理沒有錯

有用計算機嗎？ 有/沒有

23.

$2^3 \times 3^2$  之值是

A 30

B 36

C 64

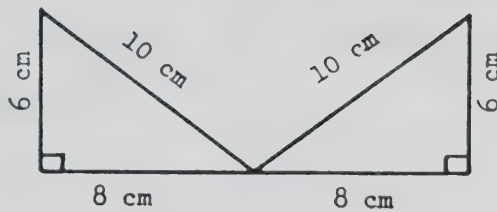
D 72

E 以上都不是

有用計算機嗎？ 有/沒有



24.

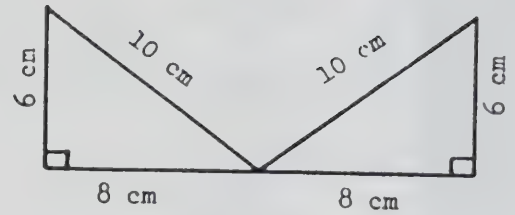


The total area of the two triangles is

- A  $6 \times 8 \text{ cm}^2$
- B  $\frac{6 \times 8}{2} \text{ cm}^2$
- C  $\frac{10 \times 6}{2} \text{ cm}^2$
- D  $\frac{16 \times 12}{2} \text{ cm}^2$
- E  $\frac{20 \times 12}{2} \text{ cm}^2$

Calculator used? Yes / No

24.



這兩個三角形的總面積是

- A  $6 \times 8 \text{ cm}^2$
- B  $\frac{6 \times 8}{2} \text{ cm}^2$
- C  $\frac{10 \times 6}{2} \text{ cm}^2$
- D  $\frac{16 \times 12}{2} \text{ cm}^2$
- E  $\frac{20 \times 12}{2} \text{ cm}^2$

有用計算機嗎? 有/沒有

25.

Soda costs  $a$  cents for each bottle, but there is a refund of  $b$  cents on each empty bottle. How much will Henry have to pay for  $x$  bottles if he brings back  $y$  empties?

- A  $ax + by$  cents
- B  $ax - by$  cents
- C  $(a - b)x$  cents
- D  $(a + x) - (b + y)$  cents
- E None of these

Calculator used? Yes / No

25. 汽水連樽每枝售  $a$  仙. 若交回空樽一個可獲發還  $b$  仙. 如果亨利買汽水  $x$  枝並交回空樽  $y$  個, 他應付款多少?

- A  $ax + by$  仙
- B  $ax - by$  仙
- C  $(a - b)x$  仙
- D  $(a + x) - (b + y)$  仙
- E 以上都不是

有用計算機嗎? 有/沒有

26.

In a school of 800 pupils,  
300 are boys. The ratio of  
the number of boys to the  
number of girls is

A 3 : 8

B 5 : 8

C 3 : 11

D 5 : 3

E 3 : 5

Calculator used?

Yes / No

27.

The arithmetic mean (average)  
of: 1.50, 2.40, 3.75  
is equal to

A 2.40

B 2.55

C 3.75

D 7.65

E None of these

Calculator used?

Yes / No

26.

在一間有 800 學生的學校  
裏有 300 個男生。男生對  
女生的比例是

A 3 : 8

B 5 : 8

C 3 : 11

D 5 : 3

E 3 : 5

有用計算機嗎?

有/沒有

27.

1.50, 2.40, 3.75 的算術平均  
(平均值) 等於

A 2.40

B 2.55

C 3.75

D 7.65

E 以上都不是

有用計算機嗎?

有/沒有



28.

A quadrilateral MUST be a parallelogram if it has

- A one pair of adjacent sides equal
- B one pair of parallel sides
- C a diagonal as axis of symmetry
- D two adjacent angles equal
- E two pairs of parallel sides

Calculator used?

Yes / No

28.

一個四邊形一定是一個平行四邊形, 如果它有

- A 一對鄰邊相等
- B 一對邊平行
- C 一條對角線作為對稱軸
- D 兩隻鄰角相等
- E 兩對邊平行

有用計算機嗎?

有/沒有

29.

One of the following points can be joined to the point  $(-3, 4)$  by a line segment which cuts NEITHER the  $x$  NOR the  $y$  axis. Which one?

- A  $(-2, 3)$
- B  $(2, -3)$
- C  $(2, 3)$
- D  $(-2, -3)$
- E  $(4, -3)$

Calculator used?

Yes / No

29.

下列其中一點可以連接  $(-3, 4)$  而不與  $x$  軸或  $y$  軸相交。是那一點呢?

- A  $(-2, 3)$
- B  $(2, -3)$
- C  $(2, 3)$
- D  $(-2, -3)$
- E  $(4, -3)$

有用計算機嗎?

有/沒有

30.

Which of the following is most likely to be nearest to the weight of a normal man?

- A 8.5 kg
- B 85 kg
- C 185 kg
- D 850 kg
- E 1850 kg

Calculator used?

Yes / No

30. 下面那一個最可能接近一個普通人的體重?

- A 8.5 kg
- B 85 kg
- C 185 kg
- D 850 kg
- E 1850 kg

有用計算機嗎?

有/沒有

的學校  
男生對女

有/沒有

算術平均

有/沒有

31.

Matchsticks are arranged as follows.



If the pattern is continued, how many matchsticks are used in making the 10th figure?

- A 30
- B 33
- C 36
- D 39
- E 42

Calculator used?

Yes / No

31.

火柴枝排列如下



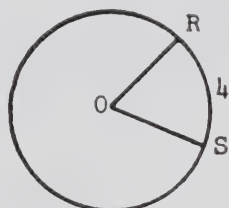
若這圖案繼續下去,第十個圖形要用多少火柴枝?

- A 30
- B 33
- C 36
- D 39
- E 42

有用計算機嗎?

有/沒有

32.



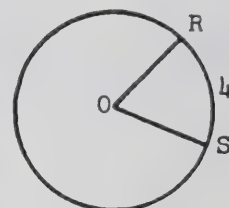
The length of the circumference of the circle with center at O is 24 and the length of arc RS is 4. What is the measure in degrees of the central angle ROS?

- A 24
- B 30
- C 45
- D 60
- E 90

Calculator used?

Yes / No

32.



上圖圓心為 O 的圓形圓周 24 向弧 RS 是 4. 中心角 ROS 是多少度?

- A 24
- B 30
- C 45
- D 60
- E 90

有用計算機嗎?

有/沒有



33.

30 is 75% of what number?

- A 40  
B 90  
C 105  
D 225  
E 2250

Calculator used?

Yes / No

34.

What is the square root of  
 $12 \times 75$ ?

- A 6.25  
B 30  
C 87  
D 625  
E 900

Calculator used?

Yes / No

35.

In the number in the box  
the digit 6 represents

- A  $6 \times \frac{1}{100}$   
B  $6 \times \frac{1}{10}$   
C  $6 \times 1$   
D  $6 \times 10$   
E  $6 \times 100$

Calculator used?

Yes / No

33.

30 是甚麼數的 75%?

- A 40  
B 90  
C 105  
D 225  
E 2250

有用計算機嗎?

有/沒有

34.

 $12 \times 75$  的平方根為何?

- A 6.25  
B 30  
C 87  
D 625  
E 900

有用計算機嗎?

有/沒有

35.

在格子裏的數中, 6 代  
表

- A  $6 \times \frac{1}{100}$   
B  $6 \times \frac{1}{10}$   
C  $6 \times 1$   
D  $6 \times 10$   
E  $6 \times 100$

有用計算機嗎?

有/沒有

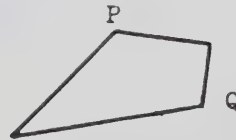
36.

If segment  $\overline{PQ}$  were drawn for each figure shown below, it would divide one of the figures into two congruent triangles. Which figure?

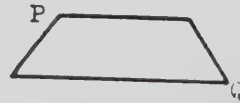
36.

如果下圖裏的  $\overline{PQ}$  都連  
起來，則會把其中一個圖形  
分成兩個全等的三角形。  
是那一個圖形？

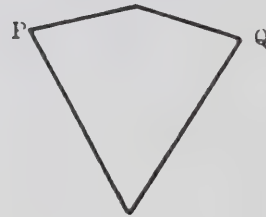
A



B



C



D



E



Calculator used?

Yes / No

有用計算機嗎?

有/沒有



37.



On the above scale the reading indicated by the arrow is between

- A 51 and 52
- B 57 and 58
- C 60 and 62
- D 62 and 64
- E 64 and 66

Calculator used?

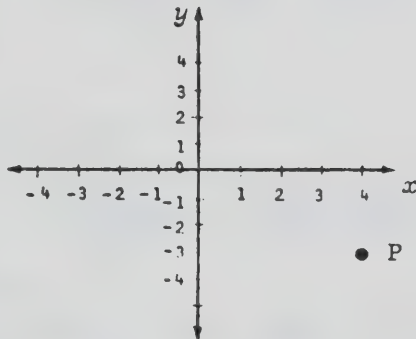
Yes / No

上面的標尺中箭頭所指是在

- A 51 及 52 之間
- B 57 及 58 之間
- C 60 及 62 之間
- D 62 及 64 之間
- E 64 及 66 之間

有用計算機嗎? 有/沒有

38.



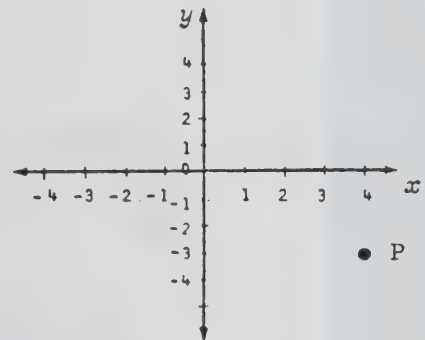
What are the coordinates of point P?

- A (-3, 4)
- B (-4, -3)
- C (3, 4)
- D (4, -3)
- E (-4, 3)

Calculator used?

Yes / No

38.



P 的坐標是甚麼?

- A (-3, 4)
- B (-4, -3)
- C (3, 4)
- D (4, -3)
- E (-4, 3)

有用計算機嗎? 有/沒有

39.

The table below compares the height from which a ball is dropped ( $d$ ) and the height to which it bounces ( $b$ ).

$d$	50	80	100	150
$b$	25	40	50	75

Which formula describes this relation?

- A  $b = d^2$   
 B  $b = 2d$   
 C  $b = \frac{d}{2}$   
 D  $b = d + 25$   
 E  $b = d - 25$

Calculator used? Yes / No

40.

The air temperature at the foot of a mountain is 31 degrees. On top of the mountain the temperature is -7 degrees. How much warmer is the air at the foot of the mountain?

- A -38 degrees  
 B -24 degrees  
 C 7 degrees  
 D 24 degrees  
 E 38 degrees

Calculator used? Yes / No

39.

下表比較一個皮球跌下的高度 ( $d$ ) 及它反彈起的高度 ( $b$ )。

$d$	50	80	100	150
$b$	25	40	50	75

那一條公式描述這個關係?

- A  $b = d^2$   
 B  $b = 2d$   
 C  $b = \frac{d}{2}$   
 D  $b = d + 25$   
 E  $b = d - 25$

有用計算機嗎? 有/沒有

40.

山腳的氣溫是 31 度。山頂的氣溫是 -7 度。山腳比山頂暖多少?

- A -38 度  
 B -24 度  
 C 7 度  
 D 24 度  
 E 38 度

有用計算機嗎? 有/沒有



球跌下時  
反彈起的

100	150
50	75

述這個關係

25

25

有/沒有

是 31 度, 山頂  
山腳較

有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

## BOOKLET 3

## COGNITIVE TEST

FORM 1/MIDDLE 1 classes

time: 45 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

- This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more familiar. Then, if you have time later, you may come back to questions which you left out.
- Please use a SOFT HB pencil throughout the whole test.
- Fill in ALL your particulars on the top of the answer sheet provided.
- The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? Yes No  
有使用計算機嗎? 有 沒有

# 學生須知

- 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
- 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
- 在答案紙的上端，請填上所有必須的資料。
- 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used? Yes No  
有使用計算機嗎? 有 沒有



1.

The cost of printing greeting cards consists of a fixed charge of 100 cents and a charge of 6 cents for each card printed. Which of the following equations can be used to determine the cost of printing  $n$  cards?

A  $\text{cost} = (100 + 6n) \text{ cents}$

B  $\text{cost} = (106 + n) \text{ cents}$

C  $\text{cost} = (6 + 100n) \text{ cents}$

D  $\text{cost} = (106n) \text{ cents}$

E  $\text{cost} = (600n) \text{ cents}$

Calculator used?

Yes / No

2.

$m$	-1	1	2	4
$n$	-1	3	5	9

For the table shown, a formula that could relate  $m$  and  $n$  is

A  $n = m$

B  $n = 3m$

C  $n = -m^2 + 1$

D  $n = m^2 + 1$

E  $n = 2m + 1$

Calculator used?

Yes / No

1.

印製賀咭的成本包括 100 仙的固定費用及每張 6 仙的印刷費。下列那一個方程式可用以決定印  $n$  張咭的成本?

A 成本 =  $(100 + 6n)$  仙

B 成本 =  $(106 + n)$  仙

C 成本 =  $(6 + 100n)$  仙

D 成本 =  $(106n)$  仙

E 成本 =  $(600n)$  仙

有用計算機嗎?

有/沒有

2.

$m$	-1	1	2	4
$n$	-1	3	5	9

從上表所示, 能夠顯示  $m$  與  $n$  關係的公式是

A  $n = m$

B  $n = 3m$

C  $n = -m^2 + 1$

D  $n = m^2 + 1$

E  $n = 2m + 1$

有用計算機嗎?

有/沒有

3.

John is 4 years older than Ellen, and Ellen is 11 years younger than Monica. Monica is 12 years old. How old is John?

- A 3 years
- B 5 years
- C 14 years
- D 19 years
- E 27 years

Calculator used? Yes / No

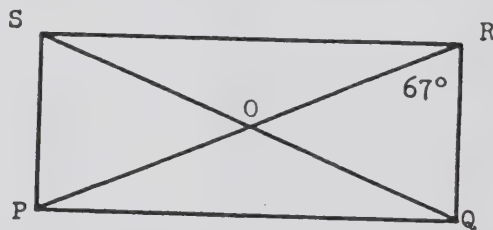
3.

約翰比愛倫大 4 歲，而愛倫比蒙妮卡小 11 歲。蒙妮卡是 12 歲，問約翰幾多歲？

- A 3 歲
- B 5 歲
- C 14 歲
- D 19 歲
- E 27 歲

有用計算機嗎？ 有 / 沒有

4.

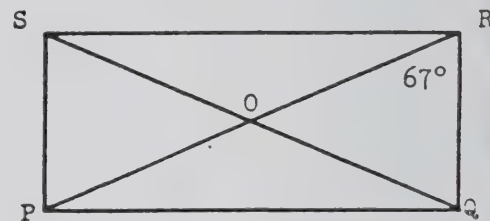


In the above rectangle the measure of  $\angle ROQ$  is

- A  $23^\circ$
- B  $45^\circ$
- C  $46^\circ$
- D  $54^\circ$
- E  $67^\circ$

Calculator used? Yes / No

4.



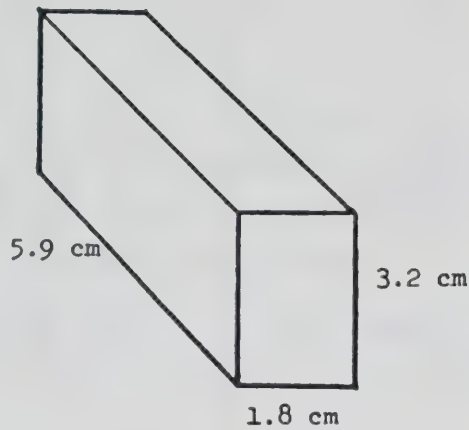
在上面的長方形中， $\angle ROQ$  是

- A  $23^\circ$
- B  $45^\circ$
- C  $46^\circ$
- D  $54^\circ$
- E  $67^\circ$

有用計算機嗎？ 有 / 沒有



5.



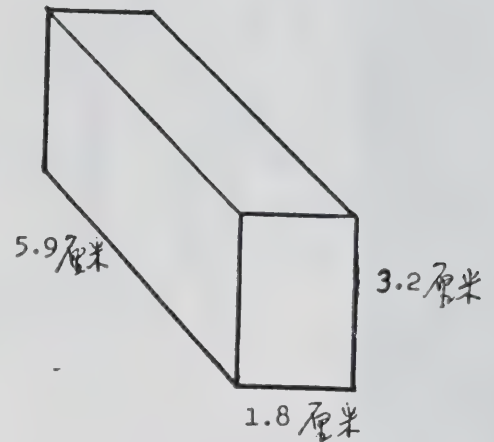
The figure above shows a rectangular box. Which of the following is closest to the volume of this box?

- A 16  $\text{cm}^3$
- B 18  $\text{cm}^3$
- C 28  $\text{cm}^3$
- D 36  $\text{cm}^3$
- E 48  $\text{cm}^3$

Calculator used?

Yes / No

5.



上圖顯示一長方盒。下列那一項最接近這盒的體積？

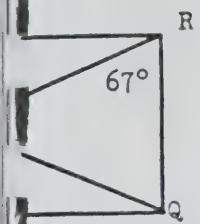
- A 16 立方厘米
- B 18 立方厘米
- C 28 立方厘米
- D 36 立方厘米
- E 48 立方厘米

有用計算機嗎？ 有/沒有

A

而愛倫  
蒙妮卡  
幾多歲？

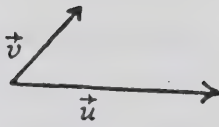
有/沒有



形中，

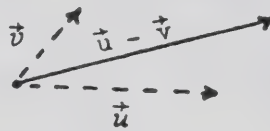
有/沒有

6.

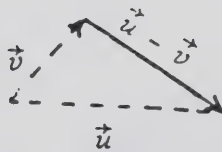


$\vec{u}$  and  $\vec{v}$  are two vectors.  
Which figure below represents  
 $\vec{u} - \vec{v}$ ?

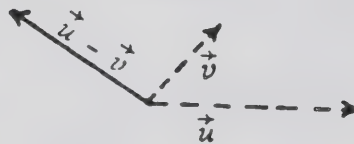
A



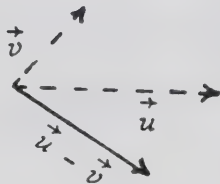
B



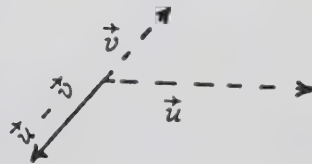
C



D



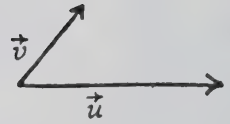
E



Calculator used?

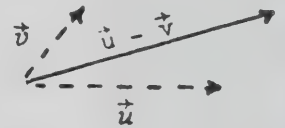
Yes / No

6.

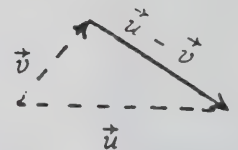


$\vec{u}$  and  $\vec{v}$  是兩個向量。  
下列那一個圖形表示  
 $\vec{u} - \vec{v}$ ?

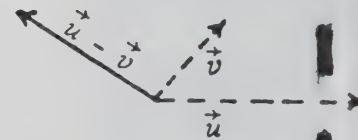
A



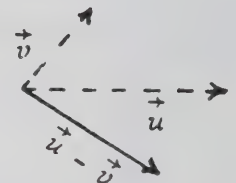
B



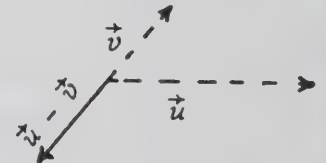
C



D



E



有用計算機嗎?

有 / 沒



7.

Joe had three test scores of 78, 76 and 74, while Mary had scores of 72, 82 and 74. How did Joe's average compare with Mary's?

- A Joe's was 1 point higher
- B Joe's was 1 point lower
- C Both averages were the same
- D Joe's was 2 points higher
- E Joe's was 2 points lower

Calculator used?

Yes / No

7. 祖有三個測驗分 78, 76 及 74, 而瑪利有三個測驗分 72, 82 及 74. 祖的平均分與瑪利的平均分怎樣比較?

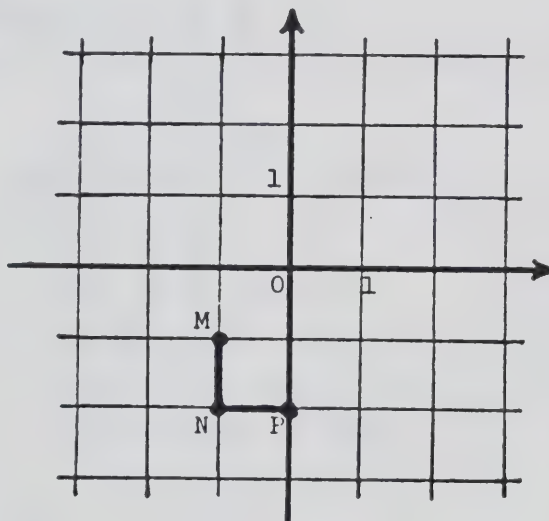
- A 祖比較高 1 分
- B 祖比較低 1 分
- C 兩人的平均分一樣
- D 祖比較高 2 分
- E 祖比較低 2 分

有用計算機嗎?

有/沒有

8.

Suppose you start at point  $M(-1, -1)$ , move a distance of one unit to  $N(-1, -2)$ , then turn left and move one unit to the point  $P(0, -2)$ . If you again turn left and move one unit, you will now be at the point with coordinates

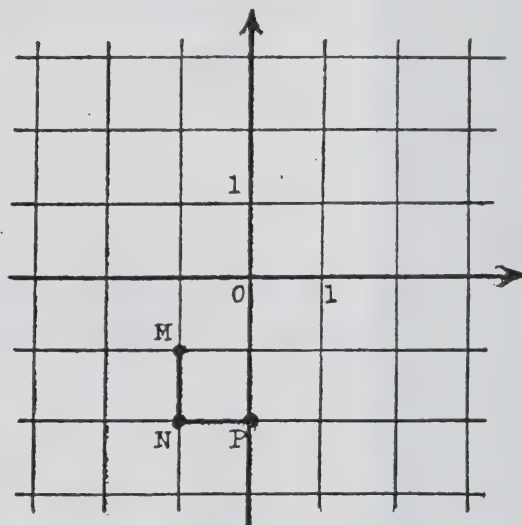


- A  $(1, -2)$
- B  $(0, -3)$
- C  $(0, -1)$
- D  $(-1, -2)$
- E None of the above

Calculator used?

Yes / No

8. 假若你從點  $M(-1, -1)$  開始移動一個單位的距離到點  $N(-1, -2)$ , 然後轉左及移動一個單位到點  $P(0, -2)$ . 如果你再轉左及移動一個單位, 你將會到達一點, 它的坐標是

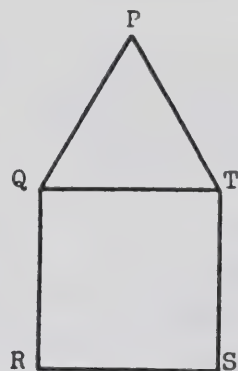


- A  $(1, -2)$
- B  $(0, -3)$
- C  $(0, -1)$
- D  $(-1, -2)$
- E 以上都不是

有用計算機嗎?

有/沒有

9.



The figure QRST is a square and PQT an equilateral triangle. If  $PQ = 6$  cm then the area of the square is

- A  $64 \text{ cm}^2$
- B  $48 \text{ cm}^2$
- C  $40 \text{ cm}^2$
- D  $36 \text{ cm}^2$
- E  $24 \text{ cm}^2$

Calculator used?

Yes / No

10.

There are 35 students in a class.  $\frac{1}{5}$  of them come to school by bus, another  $\frac{2}{5}$  come by bicycle. How many come to school by other means?

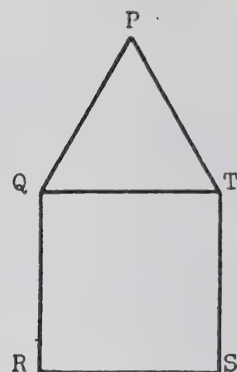
- A 7
- B 14
- C 21
- D 28
- E 35

Calculator used?

Yes / No

7

9.



圖中 QRST 是一個正方形，而 PQT 是一等邊三角形。如果  $PQ = 6$  cm，則正方形的面積是

- A  $64 \text{ cm}^2$
- B  $48 \text{ cm}^2$
- C  $40 \text{ cm}^2$
- D  $36 \text{ cm}^2$
- E  $24 \text{ cm}^2$

有用計算機嗎?

有/沒有

10.

某班有學生 35 人，其中  $\frac{1}{5}$  人乘巴士同學校，另外有  $\frac{2}{5}$  則騎單車。問有多少學生用其它方法上學?

- A 7
- B 14
- C 21
- D 28
- E 35

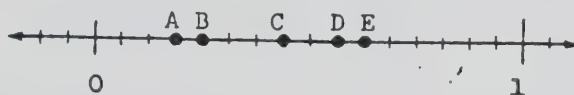
有用計算機嗎?

有/沒有



11.

Which of the points A, B, C, D, E on this number line corresponds to  $\frac{5}{8}$ ?

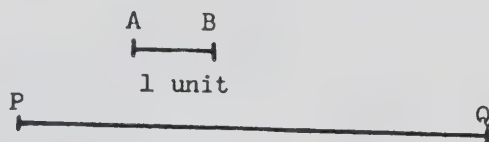


- A point A  
B point B  
C point C  
D point D  
E point E

Calculator used?

Yes / No

12.



The length of  $\overline{AB}$  is 1 unit.  
Which is the best estimate for the length of  $\overline{PQ}$ ?

- A 2 units  
B 6 units  
C 10 units  
D 14 units  
E 18 units

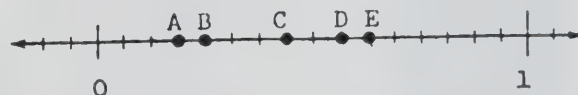
Calculator used?

Yes / No

8

11.

數軸上 A, B, C, D, E 點中  
那一點對應  $\frac{5}{8}$ ?

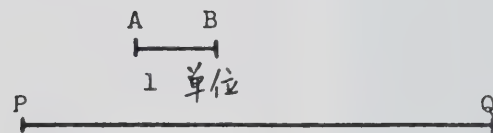


- A A 點  
B B 點  
C C 點  
D D 點  
E E 點

有用計算機嗎?

有 / 沒有

12.



$\overline{AB}$  的長度為 1 單位。  
那一項是  $\overline{PQ}$  長度的最佳估計?

- A 2 單位  
B 6 單位  
C 10 單位  
D 14 單位  
E 18 單位

有用計算機嗎?

有 / 沒有

A

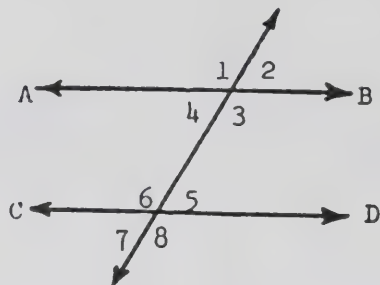
方形, 而  
形。如果  
的面積

有 / 沒有

其中  $\frac{1}{5}$  人  
有  $\frac{2}{5}$  則騎  
用其它方法

有 / 沒有

13.



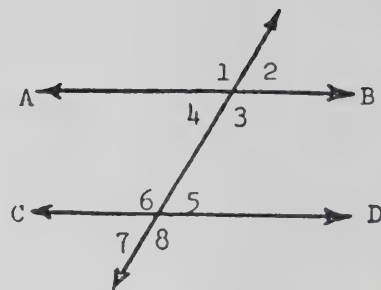
Lines  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are parallel.  
Two angles whose measures must add up to  $180^\circ$  are

- A  $\angle 1$  and  $\angle 3$
- B  $\angle 4$  and  $\angle 6$
- C  $\angle 2$  and  $\angle 5$
- D  $\angle 2$  and  $\angle 7$
- E  $\angle 1$  and  $\angle 8$

Calculator used?

Yes / No

13.



$\overleftrightarrow{AB}$  與  $\overleftrightarrow{CD}$  線平行. 角度加起來一定是  $180^\circ$  的兩角是

- A  $\angle 1$  及  $\angle 3$
- B  $\angle 4$  及  $\angle 6$
- C  $\angle 2$  及  $\angle 5$
- D  $\angle 2$  及  $\angle 7$
- E  $\angle 1$  及  $\angle 8$

有用計算機嗎?

有/沒有

14.

What is the name of the solid figure, each of whose faces is a square?

- A cube
- B pyramid
- C tetrahedron
- D hexagon
- E cylinder

Calculator used?

Yes / No

14.

每一面都是一個正方形的立體圖形, 它的名稱是甚麼?

- A 立方體
- B 金字塔
- C 四面體
- D 六邊形
- E 圓柱體

有用計算機嗎?

有/沒有



15.

A student's solution to the problem

 $\frac{-2}{5} \times \frac{3}{-2} \times \frac{5}{6}$  is given below.

$$\frac{(-2) \times 3 \times 5}{5 \times (-2) \times 6} \quad (i)$$

$$= \frac{(-2) \times 3 \times 5}{(-2) \times 6 \times 5} \quad (ii)$$

$$= 1 \times \frac{3}{6} \times 1 \quad (iii)$$

$$= \frac{1}{2} \quad (iv)$$

Check the student's work and decide if there are any errors. In which line does any error FIRST APPEAR?

- A line (i)  
 B line (ii)  
 C line (iii)  
 D line (iv)  
 E There is no error. The work is correct.

Calculator used?

Yes / No

16. 20% of 125 is equal to

A 6.25

B 12.50

C 15

D 25

E 50

Calculator used?

Yes / No

10

15.

某學生做算題  $\frac{-2}{5} \times \frac{3}{-2} \times \frac{5}{6}$   
 其演算列下：

$$\frac{(-2) \times 3 \times 5}{5 \times (-2) \times 6} \quad (i)$$

$$= \frac{(-2) \times 3 \times 5}{(-2) \times 6 \times 5} \quad (ii)$$

$$= 1 \times \frac{3}{6} \times 1 \quad (iii)$$

$$= \frac{1}{2} \quad (iv)$$

請核對這學生的演算及決定  
 有沒有錯誤。如果有錯誤，  
 則它第一次出現在

- A 第 (i) 行  
 B 第 (ii) 行  
 C 第 (iii) 行  
 D 第 (iv) 行  
 E 沒有錯誤。演算正確。

有用計算機嗎？

有/沒有

16. 125 的 20% 等於

A 6.25

B 12.50

C 15

D 25

E 50

有用計算機嗎？

有/沒有

17.

If  $10^2 \times 10^3 = 10^n$  then  $n$  is equal to

- A 4
- B 5
- C 6
- D 8
- E 9

Calculator used?

Yes / No

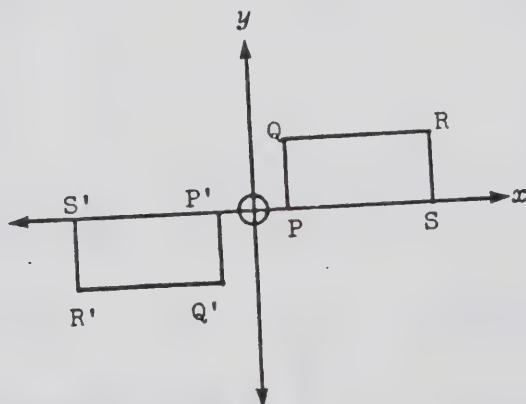
17.

若  $10^2 \times 10^3 = 10^n$  則  $n$  等於

- A 4
- B 5
- C 6
- D 8
- E 9

有用計算機嗎? 有/沒有

18.



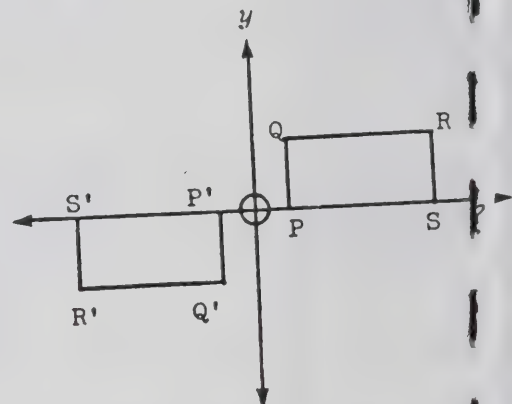
PQRS is a rectangle. Its image after a transformation is the rectangle P'Q'R'S', as shown above. The transformation used could have been

- A a rotation about the origin
- B a reflection in the  $y$ -axis
- C a translation parallel to the  $x$ -axis
- D a reflection in the  $x$ -axis
- E a translation parallel to the  $y$ -axis.

Calculator used?

Yes / No

18.



PQRS 是一個長方形。經過一變換後的映像是 P'Q'R'S'，如上圖所示。變換可能是

- A 對於原點的一個旋轉
- B 對於  $y$  軸的一個反射
- C 平行於  $x$  軸的一個位
- D 對於  $x$  軸的一個反射
- E 平行於  $y$  軸的一個位

有用計算機嗎? 有/沒有



19. You wish to know whether SLOSH is the most popular soft-drink in your school. The way of finding out, from among the following, which will give results you can be most sure of, will be to

- A note the number of empty SLOSH bottles in the trash cans
- B ask the manager of the snack bar how many cases of SLOSH he has ordered in the last month.
- C get your friends to ask around to see which people prefer SLOSH and to tell you their findings
- D discuss with the driver of the soft-drink delivery truck what he thinks of SLOSH
- E keep a record of soft-drink sales in the school by brand name over a period of 1 week.

Calculator used?

Yes / No

19. 你想知道 SLOSH 在你的學校是否最受歡迎的汽水。要找出確實的答案，最好的方法是

- A 在廢物箱中數一數 SLOSH 的空樽
- B 問小食部經理他在上月裏訂了多少 SLOSH
- C 找你朋友叫他們問問四週那些人較喜愛 SLOSH
- D 與送 SLOSH 的汽水車司機討論他對 SLOSH 的意見
- E 在一週內記一個各種牌子飲品的銷售紀錄

有用計算機嗎?

有/沒有

20.

If the ratio of 2 to 5 equals the ratio of  $n$  to 100, then  $n$  is equal to

- A 10
- B 20
- C 40
- D 150
- E 250

Calculator used?

Yes / No

20.

如果 2 比 5 等於  $n$  比 100, 則  $n$  等於

- A 10
- B 20
- C 40
- D 150
- E 250

有用計算機嗎?

有/沒有

21. The value of  $0.2131 \times 0.02958$  is approximately

- A 0.6
- B 0.06
- C 0.006
- D 0.0006
- E 0.00006

Calculator used?

Yes / No

21.  $0.2131 \times 0.02958$  之值大約等於

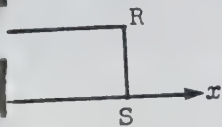
- A 0.6
- B 0.06
- C 0.006
- D 0.0006
- E 0.00006

有用計算機嗎?

有/沒有

n

有/沒有



過一變換後  
以上圖所示。

多一個旋轉  
多一個反射  
多一個位移  
多一個反射  
多一個位移

有/沒有

22.

$-5(6 - 4)$  is equal to

- A 50  
B 26  
C 10  
D -10  
E -26

Calculator used?

Yes / No

22.

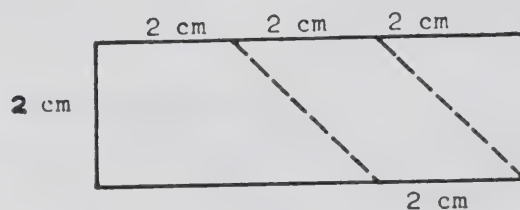
$-5(6 - 4)$  等於

- A 50  
B 26  
C 10  
D -10  
E -26

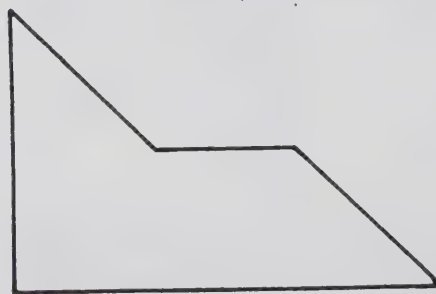
有用計算機嗎?

有/沒有

23.



The rectangle shown above is cut along the dotted lines and the three parts put together, without overlapping, to give the figure shown below.



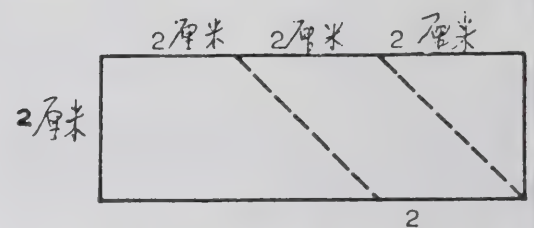
The area in square centimeters of this figure is

- A  $8 \text{ cm}^2$   
B  $10 \text{ cm}^2$   
C  $12 \text{ cm}^2$   
D  $14 \text{ cm}^2$   
E  $16 \text{ cm}^2$

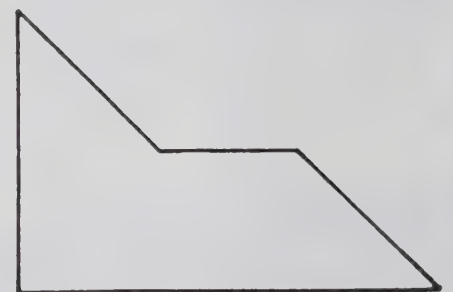
Calculator used?

Yes / No

23.



上圖顯示一個沿虛線被剪開的長方形，然後沒有重疊的拼放在一起，砌成下列的圖形。



這圖形的面積，以平方厘米是

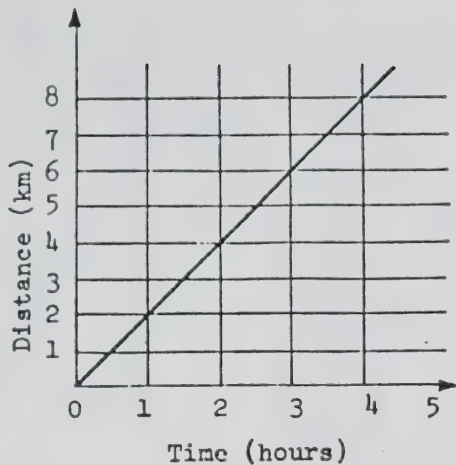
- A 8 平方厘米  
B 10 平方厘米  
C 12 平方厘米  
D 14 平方厘米  
E 16 平方厘米

有用計算機嗎?

有/沒有



24.



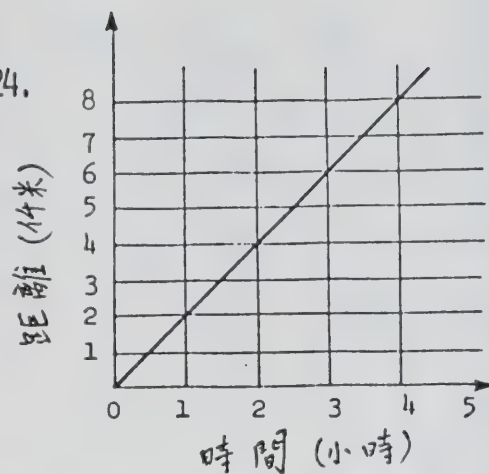
The graph shows the distance traveled by a tractor during a period of 4 hours. How fast is the tractor moving?

- A 1 kilometer per hour
- B 2 kilometers per hour
- C 4 kilometers per hour
- D 8 kilometers per hour
- E There is not enough information

Calculator used?

Yes / No

24.



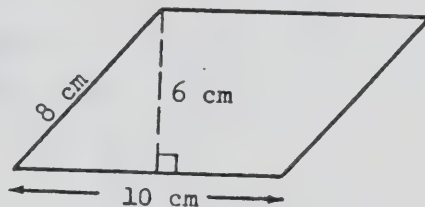
上圖顯示一拖拉機在4小時內所行的距離。問拖拉機移動得多快？

- A 每小時 1 千米
- B 每小時 2 千米
- C 每小時 4 千米
- D 每小時 8 千米
- E 資料不足

有用計算機嗎？

有/沒有

25.



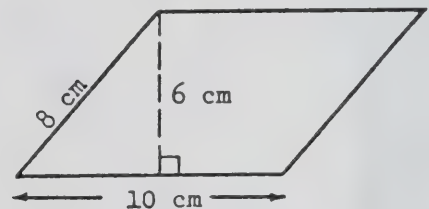
What is the area of the above parallelogram?

- A  $30 \text{ cm}^2$
- B  $36 \text{ cm}^2$
- C  $48 \text{ cm}^2$
- D  $60 \text{ cm}^2$
- E  $80 \text{ cm}^2$

Calculator used?

Yes / No

25.



上圖中的平行四邊形的面積是多少？

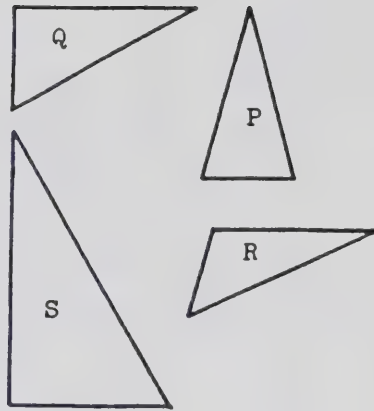
- A  $30 \text{ cm}^2$
- B  $36 \text{ cm}^2$
- C  $48 \text{ cm}^2$
- D  $60 \text{ cm}^2$
- E  $80 \text{ cm}^2$

有用計算機嗎？

有/沒有

A

26.



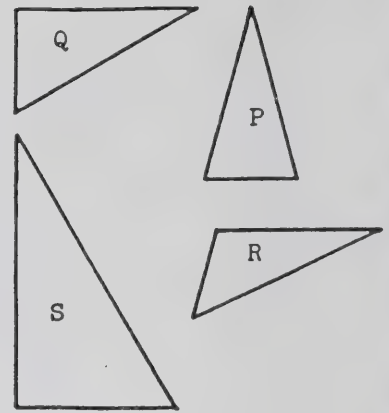
Two of these triangles are similar.  
They are

- A P and R
- B P and S
- C R and S
- D Q and R
- E Q and S

Calculator used?

Yes / No

26.



這些三角形中有兩個是相似的。  
它們是

- A P 及 R
- B P 及 S
- C R 及 S
- D Q 及 R
- E Q 及 S

有用計算機嗎?

有/沒有

27.

$$\begin{array}{r} 1054 \\ -865 \\ \hline \end{array}$$

- A 189
- B 199
- C 211
- D 289
- E 299

Calculator used?

Yes / No

27.

$$\begin{array}{r} 1054 \\ -865 \\ \hline \end{array}$$

- A 189
- B 199
- C 211
- D 289
- E 299

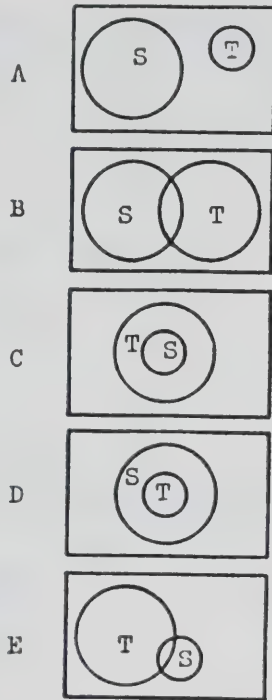
有用計算機嗎?

有/沒有

A



28. Which one of the following diagrams illustrates the statement, "Set S is a subset of Set T"?



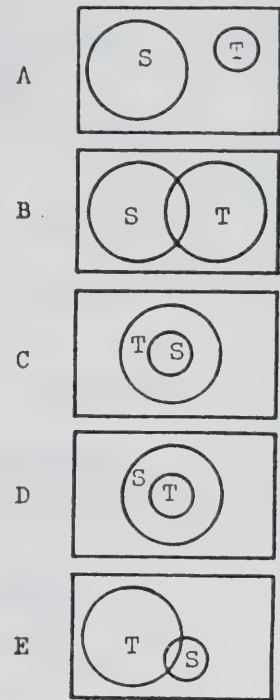
Calculator used? Yes / No

29. When  $x = 2$ ,  $\frac{7x + 4}{5x - 4}$  is equal to

- A 11
- B 3
- C  $\frac{11}{5}$
- D  $\frac{2}{5}$
- E  $\frac{7}{5}$

Calculator used? Yes / No

28. 下列那一圖形顯示句子  
"集 S 為集 T 的子集"?



有用計算機嗎? 有/沒有

29. 當  $x = 2$ ,  $\frac{7x + 4}{5x - 4}$  等於

- A 11
- B 3
- C  $\frac{11}{5}$
- D  $\frac{2}{5}$
- E  $\frac{7}{5}$

有用計算機嗎? 有/沒有

30.

If  $S$  is the set of points with  $x$ -coordinate greater than 3, and  $T$  is the set of points with  $y$ -coordinate greater than 6, which of the following is a member of both sets?

- A (4,8)
- B (7,4)
- C (2,8)
- D (4,4)
- E (2,4)

Calculator used?

Yes / No

31.

The distance between two towns is usually measured in

- A millimeters
- B centimeters
- C decimeters
- D meters
- E kilometers

Calculator used?

Yes / No

32.

Which equation is true for all values of  $n$ ?

- A  $2 + n = n + 2$
- B  $3 + n = 4 + 2$
- C  $n + 1 = 1$
- D  $2n + 1 = n$
- E  $n + 3 = 3n$

Calculator used?

Yes / No

30.

如果  $S$  是所有  $x$  坐標大於 3 的點所組成的集，而  $T$  是所有  $y$  坐標大於 6 的點所組成的集，下列那一點同時屬於兩集？

- A (4,8)
- B (7,4)
- C (2,8)
- D (4,4)
- E (2,4)

有用計算機嗎？

有 / 沒有

31.

兩城鎮間的距離通常以甚麼單位量度？

- A 毫米
- B 厘米
- C 分米
- D 米
- E 仟米

有用計算機嗎？

有 / 沒有

32.

那一方程式對於所有的  $n$  都為真？

- A  $2 + n = n + 2$
- B  $3 + n = 4 + 2$
- C  $n + 1 = 1$
- D  $2n + 1 = n$
- E  $n + 3 = 3n$

有用計算機嗎？

有 / 沒有



33.

Which of the following is equal to a quarter of a million?

- A 25,250  
B 40,000  
C  $\frac{1}{4,000,000}$   
D 250,000  
E 2,500,000

Calculator used?

Yes / No

33.

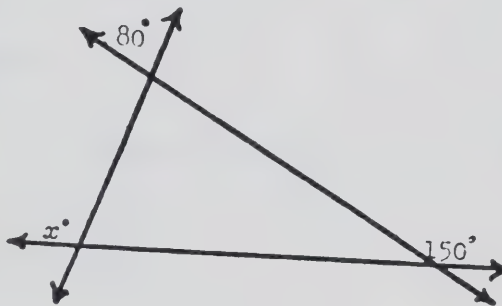
下列那一項等於一百萬的四分之一?

- A 25,250  
B 40,000  
C  $\frac{1}{4,000,000}$   
D 250,000  
E 2,500,000

有用計算機嗎?

有/沒有

34.



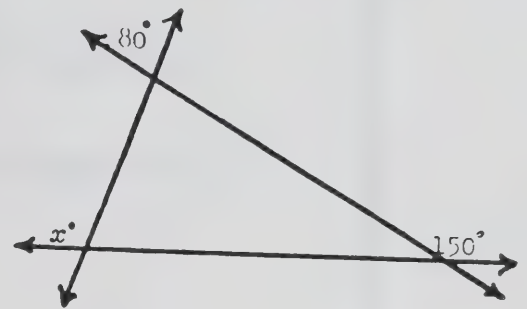
Three straight lines intersect as shown in the diagram. What is  $x$  equal to?

- A 30  
B 50  
C 60  
D 110  
E 150

Calculator used?

Yes / No

34.



三直線如圖所示相交  
 $x$  等於甚麼?

- A 30  
B 50  
C 60  
D 110  
E 150

有用計算機嗎?

有/沒有

A

- END -

- 完 -



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 4

COGNITIVE TEST

FORM 1/MIDDLE 1 classes

time: 45 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81



# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an inter-national test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more familiar. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

☒ A ☐ B ☐ C ☐ D ☐ E  
 Calculator used? ☒ Yes ☐ No  
 有使用計算機嗎? 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的问题。然後，如果你有時間，你可以再答你留空了的问题。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

☒ A ☐ B ☐ C ☐ D ☐ E  
 Calculator used? ☒ Yes ☐ No  
 有使用計算機嗎? 有 沒有

1.

If  $\frac{4x}{12} = 0$ , then  $x$  is equal to

A 0

B 3

C 8

D 12

E 16

Calculator used?

Yes / No

2.

2 meters + 3 millimeters  
is equal to

A 2.0003 meters

B 2.003 meters

C 2.03 meters

D 2.3 meters

E 5 meters

Calculator used?

Yes / No

1.

若  $\frac{4x}{12} = 0$ ,  $x$  等於

A 0

B 3

C 8

D 12

E 16

有用計算機嗎?

有/沒有

2.

2 米 + 3 毫米 等於

A 2.0003 米

B 2.003 米

C 2.03 米

D 2.3 米

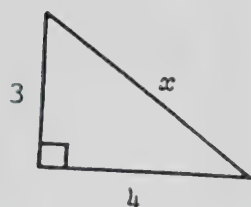
E 5 米

有用計算機嗎?

有/沒有



3.



Which of these is a correct statement for this triangle?

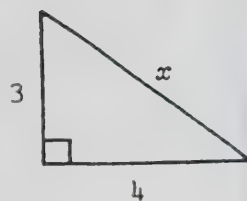
- A  $x^2 = 3^2 + 4^2$
- B  $x^2 + 3^2 = 4^2$
- C  $x = 4^2 - 3^2$
- D  $x^2 = 4^2 - 3^2$
- E  $x = 4 + 3$

Calculator used?

Yes / No

3

3.



那一句對於這三角形是正確的

- A  $x^2 = 3^2 + 4^2$
- B  $x^2 + 3^2 = 4^2$
- C  $x = 4^2 - 3^2$
- D  $x^2 = 4^2 - 3^2$
- E  $x = 4 + 3$

有用計算機嗎?

有/沒有

4.

If  $y$  dollars are shared equally among four boys, how many dollars does each boy receive?

- A  $y - 4$
- B  $\frac{4}{y}$
- C  $4$
- D  $\frac{y}{4}$
- E  $4y$

Calculator used?

Yes / No

4.

若  $y$  元平均分給四個男孩子, 每人可得若干元?

- A  $y - 4$
- B  $\frac{4}{y}$
- C  $4$
- D  $\frac{y}{4}$
- E  $4y$

有用計算機嗎?

有/沒有

5.

$\frac{a}{15} - \frac{b}{5}$  is equal to

- A  $\frac{a-3b}{15}$
- B  $\frac{5a-15b}{15}$
- C  $\frac{a-b}{10}$
- D  $\frac{a-b}{75}$
- E None of these

Calculator used?

Yes / No

5.

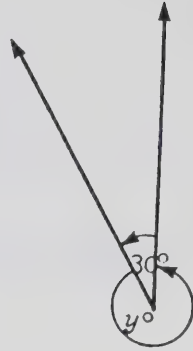
$\frac{a}{15} - \frac{b}{5}$  等於

- A  $\frac{a-3b}{15}$
- B  $\frac{5a-15b}{15}$
- C  $\frac{a-b}{10}$
- D  $\frac{a-b}{75}$
- E 以上皆不是

有用計算機嗎?

有/沒有

6.



Which statement can be used to find the value of  $y$ ?

- A  $y = 180 - 30$
- B  $y = 270 - 30$
- C  $y = 270 + 30$
- D  $y = 360 - 30$
- E  $y = 360 + 30$

Calculator used?

Yes / No

7.

Michael has a large number of wooden blocks which are cubical in shape with each edge 1 centimeter long. What is the maximum number of these blocks that can be used to fill a rectangular box with interior dimensions 10 centimeters long, 10 centimeters wide and 7 centimeters high?

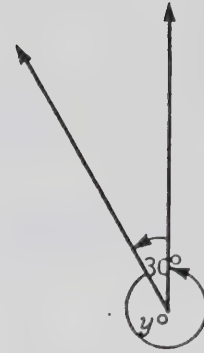
- A 27
- B 70
- C 140
- D 280
- E 700

Calculator used?

Yes / No

4

6.



那一句子能被用以求  $y$  之值?

- A  $y = 180 - 30$
- B  $y = 270 - 30$
- C  $y = 270 + 30$
- D  $y = 360 - 30$
- E  $y = 360 + 30$

有用計算機嗎?

有 / 沒有

7.

米高有很多每邊長 1 厘米的正方體積木。要填滿一長方盒，其內部大小是 10 厘米長，10 厘米闊及 7 厘米高，最多要用多少塊積木?

- A 27
- B 70
- C 140
- D 280
- E 700

有用計算機嗎?

有 / 沒有

B

這是正確的!

有 / 沒有

固男孩子,

有 / 沒有

有 / 沒有

8.

$$\begin{array}{rcl}
 \text{1st row} & & 1 \\
 \text{2nd row} & & 1 - 1 \\
 \text{3rd row} & & 1 - 1 + 1 \\
 \text{4th row} & & 1 - 1 + 1 - 1 \\
 \text{5th row} & & 1 - 1 + 1 - 1 + 1
 \end{array}$$

What is the sum of the 50th row?

- |   |    |
|---|----|
| A | 0  |
| B | 1  |
| C | 2  |
| D | 25 |
| E | 30 |

Calculator used?

Yes / No

9.

162 x 45 is equal to

- |   |      |
|---|------|
| A | 1378 |
| B | 1458 |
| C | 5890 |
| D | 6290 |
| E | 7290 |

Calculator used?

Yes / No

8.

第 1 行								1
第 2 行					1	-	1	
第 3 行			1	-	1		+	1
第 4 行		1	-	1		+	1	-
第 5 行	1	-	1		+	1	-	1

第 50 行數列之和是多少？

- |   |    |
|---|----|
| A | 0  |
| B | 1  |
| C | 2  |
| D | 25 |
| E | 30 |

有用計算機嗎？

有 / 沒有

9.

$162 \times 45$  等於

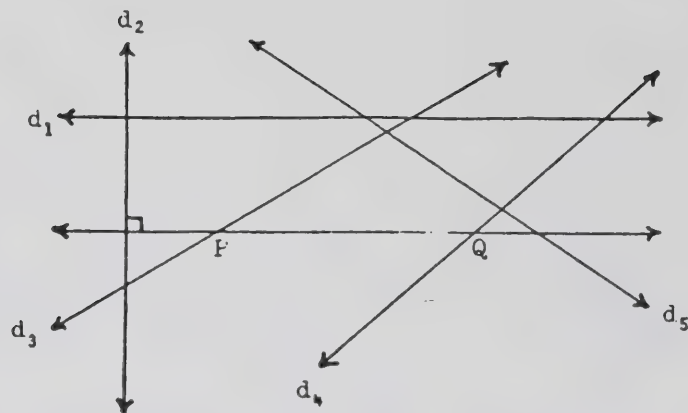
- |   |      |
|---|------|
| A | 1378 |
| B | 1458 |
| C | 5890 |
| D | 6290 |
| E | 7290 |

有用計算機嗎？

有 / 沒有



10.



Among the following lines  $d_1, d_2, d_3, d_4, d_5$ , which has no point equidistant from P and from Q?

- A  $d_1$
- B  $d_2$
- C  $d_3$
- D  $d_4$
- E  $d_5$

Calculator used?

Yes / No

在下列  $d_1, d_2, d_3, d_4, d_5$  線中，那些不含與 P 及 Q 等距的點？

- A  $d_1$
- B  $d_2$
- C  $d_3$
- D  $d_4$
- E  $d_5$

有用計算機嗎？

有/沒有

11.

Which of these numbers is a prime number?

- A 21
- B 22
- C 23
- D 24
- E 25

Calculator used?

Yes / No

11.

這些數中那一個是質數？

- A 21
- B 22
- C 23
- D 24
- E 25

有用計算機嗎？

有/沒有

+ 1

- 1

1 + 1

是多少？

有/沒有

有/沒有

12.

A runner ran 3,000 meters in exactly 8 minutes. What was his average speed in meters per second?

A 3.75

B 6.25

C 16.0

D 37.5

E 62.5

Calculator used?

Yes / No

13.

$a$ ,  $b$  and  $c$  are numbers greater than 0. Which of these is NOT equal to  $\frac{a}{b}$ ?

A  $\frac{a}{b} \times \frac{-3}{-3}$

B  $\frac{a}{b} \times \frac{c}{c}$

C  $\frac{a}{b} \times \frac{101}{101}$

D  $\frac{a}{b} \times 1$

E  $\frac{a}{b} \times 0$

Calculator used?

Yes / No

12.

一競跑者在恰好 8 分鐘內  
了 3,000 米。他的平均速度，  
每秒若干米計，是甚麼？

A 3.75

B 6.25

C 16.0

D 37.5

E 62.5

有用計算機嗎？

有 / 沒有

13.

$a$ ,  $b$  及  $c$  皆為大於 0 的數  
那一數不等於  $\frac{a}{b}$ ?

A  $\frac{a}{b} \times \frac{-3}{-3}$

B  $\frac{a}{b} \times \frac{c}{c}$

C  $\frac{a}{b} \times \frac{101}{101}$

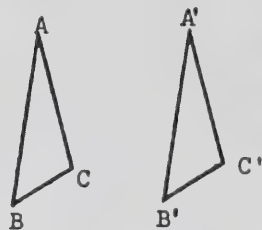
D  $\frac{a}{b} \times 1$

E  $\frac{a}{b} \times 0$

有用計算機嗎？

有 / 沒有

14.



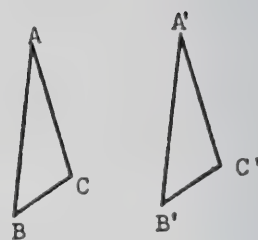
$\triangle ABC$  and  $\triangle A'B'C'$  are congruent and their corresponding sides are parallel.  $\triangle ABC$  maps onto  $\triangle A'B'C'$  by a

- A reflection
- B glide reflection
- C rotation
- D enlargement
- E translation

Calculator used?

Yes / No

14.



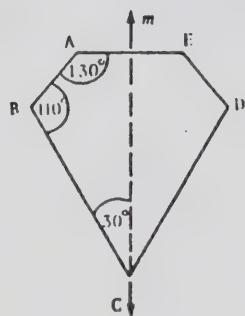
$\triangle ABC$  與  $\triangle A'B'C'$  全等而它們對應邊平行.  $\triangle ABC$  是經由那一個變換映到  $\triangle A'B'C'$  的呢?

- A 反射
- B 滑動反射
- C 旋轉
- D 放大
- E 位移

有用計算機嗎?

有/沒有

15.



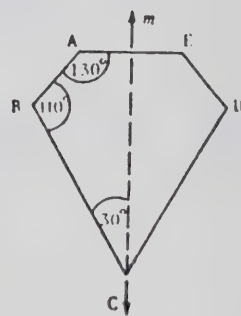
The line  $m$  is a line of symmetry for figure ABCDE. The measure of angle BCD is

- A  $30^\circ$
- B  $50^\circ$
- C  $60^\circ$
- D  $70^\circ$
- E  $110^\circ$

Calculator used?

Yes / No

15.



線  $m$  為圖形 ABCDE 之對稱軸. 角 BCD 是

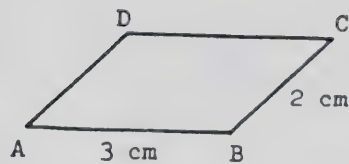
- A  $30^\circ$
- B  $50^\circ$
- C  $60^\circ$
- D  $70^\circ$
- E  $110^\circ$

有用計算機嗎?

有/沒有



16.

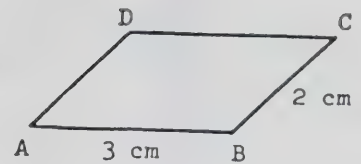


$\overline{AB} \parallel \overline{DC}$  and  $\overline{AD} \parallel \overline{BC}$ . Quadrilateral ABCD is a

- A rhombus
- B parallelogram
- C square
- D rectangle
- E none of the above

Calculator used? Yes / No

16.



$\overline{AB} \parallel \overline{DC}$  及  $\overline{AD} \parallel \overline{BC}$ . 四邊形 ABCD 是一個

- A 菱形
- B 平行四邊形
- C 正方形
- D 長方形
- E 以上都不是

有用計算機嗎? 有/沒

17.

A 15 centimeter piece is cut from a ribbon 1 meter long. What is the length of the remaining piece?

- A 85 cm
- B 115 cm
- C 985 cm
- D 1015 cm
- E 9985 cm

Calculator used? Yes / No

17.

從一米的絲帶中剪出 15 厘米。餘下一段的長度是多少?

- A 85 cm
- B 115 cm
- C 985 cm
- D 1015 cm
- E 9985 cm

有用計算機嗎? 有/沒

18.

Test Score	Tally	Frequency
4	/	1
5	///	3
6	/// /	6
7	//	2
8	////	4
9	///	3
10	/	1

The table shows scores for a class on a 10-point test. How many in the class made a score **GREATER THAN 7**?

- A 2  
B 8  
C 10  
D 12  
E 20

Calculator used?

Yes / No

18.

分數	記數符	頻率
4	/	1
5	///	3
6	/// /	6
7	//	2
8	////	4
9	///	3
10	/	1

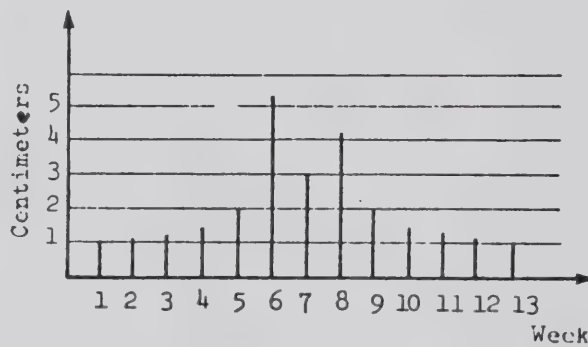
表中顯示一班學生在一個滿分為 10 分的測驗裏所得的分數。班中有多少學生得到多過 7 分?

- A 2  
B 8  
C 10  
D 12  
E 20

有用計算機嗎?

有/沒有

19.



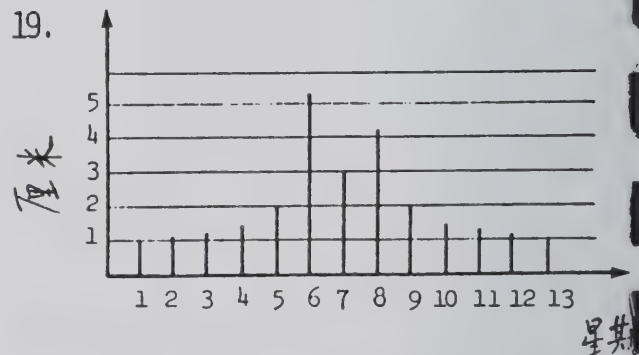
In the graph, rainfall in centimeters is plotted for 13 weeks. The average weekly rainfall during the period is approximately

- A 1 centimeter  
B 2 centimeters  
C 3 centimeters  
D 4 centimeters  
E 5 centimeters

Calculator used?

Yes / No

19.



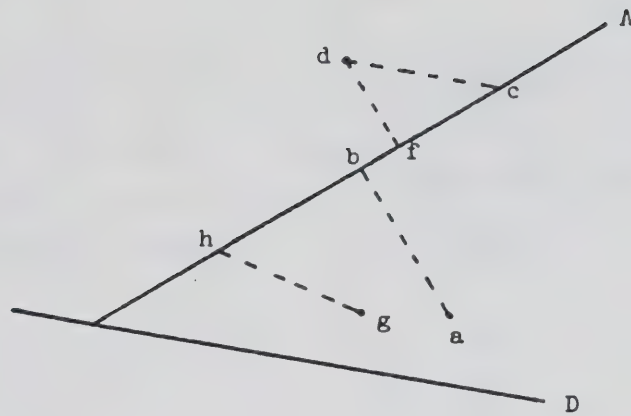
13 星期的雨量紀錄(以厘米計)都在圖裏表出。這期間的平均每週雨量紀錄大約是

- A 1 厘米  
B 2 厘米  
C 3 厘米  
D 4 厘米  
E 5 厘米

有用計算機嗎?

有/沒有

20.



If D is the direction of projection and A is the axis of projection, which of the following statements is correct?

- A  $p(a) = b$
- B  $p(d) = c$
- C  $p(d) = f$
- D  $p(g) = h$
- E  $p(c) = d$

若 D 為投影的方向而 A 是投影軸, 下列那一句子是正確的?

- A  $p(a) = b$
- B  $p(d) = c$
- C  $p(d) = f$
- D  $p(g) = h$
- E  $p(c) = d$

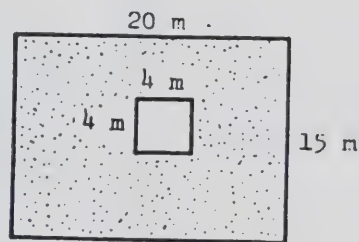
Calculator used?

Yes / No

有用計算機嗎?

有/沒有

21.



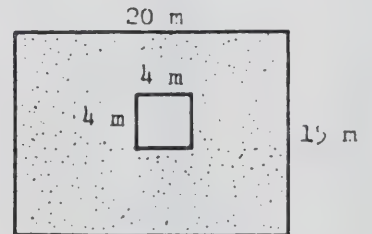
A square is removed from the rectangle as shown. What is the area of the remaining part?

- A  $316 \text{ m}^2$
- B  $300 \text{ m}^2$
- C  $284 \text{ m}^2$
- D  $80 \text{ m}^2$
- E  $16 \text{ m}^2$

Calculator used?

Yes / No

21.



如上圖所示, 長方形內一正方形被剪去。餘下部份的面積是多?

- A  $316 \text{ m}^2$
- B  $300 \text{ m}^2$
- C  $284 \text{ m}^2$
- D  $80 \text{ m}^2$
- E  $16 \text{ m}^2$

有用計算機嗎?

有/沒有



22.

Since  $4 \times 9 = 36$ , $\sqrt{36}$  is equal to

A  $4 \times 9$

B  $4 \times 3$

C  $2 \times 9$

D  $2 \times 3$

E  $\sqrt{2} \times \sqrt{3}$

Calculator used?

Yes / No

22.

因為  $4 \times 9 = 36$ , 所以 $\sqrt{36}$  等於

A  $4 \times 9$

B  $4 \times 3$

C  $2 \times 9$

D  $2 \times 3$

E  $\sqrt{2} \times \sqrt{3}$

有用計算機嗎? 有/沒有

23.



The position on the scale indicated by the arrow is

A 1.004

B 1.04

C 1.08

D 1.4

E 1.8

Calculator used?

Yes / No

23.



刻度中箭頭所指著的位置是

A 1.004

B 1.04

C 1.08

D 1.4

E 1.8

有用計算機嗎? 有/沒有

B

是投影的?

有/沒有

1.5 m

夕一正方形面積是多少?

有/沒有

24.

A painter is to mix green and yellow paint in the ratio of 4 to 7 to obtain the color he wants. If he has 28 liters of green paint, how many liters of yellow paint should be added?

- A 11
- B 16
- C 28
- D 49
- E 196

Calculator used?

Yes / No

24.

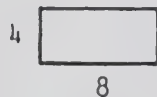
一油漆要混和綠油與黃油成 4 對 7 之比例而欲得其想要的顏色。如果他有 28 公升綠油，他須要加多少公升黃油？

- A 11
- B 16
- C 28
- D 49
- E 196

有用計算機嗎？

有 / 沒有

25.



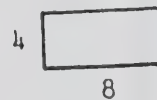
One of the following figures is congruent with the figure above. Which one?

- A
- B
- C
- D
- E

Calculator used?

Yes / No

25.



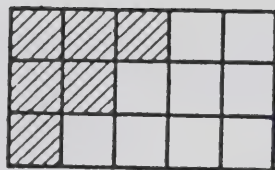
下列其中一個圖形與以上的圖形全等。是那一個？

- A
- B
- C
- D
- E

有用計算機嗎？

有 / 沒有

26.



In the figure the little squares are all of the same size and the area of the whole rectangle is equal to 1. The area of the shaded part is equal to

A  $\frac{2}{15}$

B  $\frac{1}{3}$

C  $\frac{2}{5}$

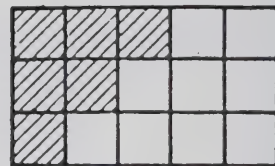
D  $\frac{3}{8}$

E  $\frac{1}{2}$

Calculator used?

Yes / No

26.



在圖中所有細方格的面積相同  
整個長方形的面積為 1. 陰影  
部份面積是

A  $\frac{2}{15}$

B  $\frac{1}{3}$

C  $\frac{2}{5}$

D  $\frac{3}{8}$

E  $\frac{1}{2}$

有用計算機嗎?

有/沒有

與黃油成  
其想要的  
升綠油,他  
?

有/沒有

與以上的  
個?

27.

Four 1-liter bowls of ice cream were set out at a party. After the party, 1 bowl was empty, 2 were half full, and 1 was three-quarters full. How many liters of ice cream had been EATEN?

A  $3\frac{3}{4}$

B  $2\frac{3}{4}$

C  $2\frac{1}{2}$

D  $1\frac{3}{4}$

E None of these

Calculator used?

Yes / No

有/沒有

27.

在茶會中有四盒 1-公斤的雪糕  
茶會完後, 1 盒空了, 2 盒半滿,  
而 1 盒有四份三滿, 問有多少  
公斤的雪糕被吃去?

A  $3\frac{3}{4}$

B  $2\frac{3}{4}$

C  $2\frac{1}{2}$

D  $1\frac{3}{4}$

E 以上都不是

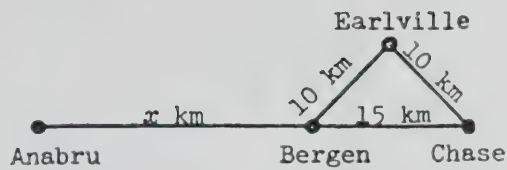
有用計算機嗎?

有/沒有

B



28.



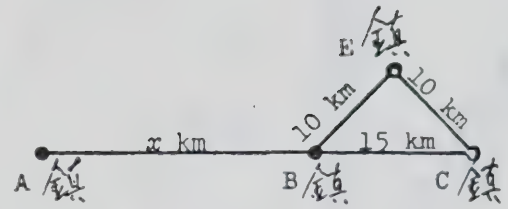
The Davis family took a car trip from Anabru through Bergen to Chase. They then drove back to Bergen through Earlville, and then returned to their home in Anabru. If the total distance they drove was 115 kilometers, how far is it from Anabru to Bergen?

- A 20 kilometers
- B 35 kilometers
- C 40 kilometers
- D 75 kilometers
- E 80 kilometers

Calculator used?

Yes / No

28.



大衛一家乘車由A鎮經B鎮到C鎮。然後他們經E鎮駛回B鎮，再返回A鎮的家。如果他們共行了115千米，問由A到B鎮的距離是多少千米？

- A 20 千米
- B 35 千米
- C 40 千米
- D 75 千米
- E 80 千米

有用計算機嗎？

有/沒有

29.

0.00046 is equal to .

- A  $46 \times 10^{-3}$
- B  $4.6 \times 10^{-4}$
- C  $0.46 \times 10^3$
- D  $4.6 \times 10^4$
- E  $46 \times 10^5$

Calculator used?

Yes / No

29.

0.00046 等於

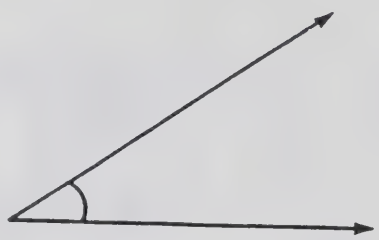
- A  $46 \times 10^{-3}$
- B  $4.6 \times 10^{-4}$
- C  $0.46 \times 10^3$
- D  $4.6 \times 10^4$
- E  $46 \times 10^5$

有用計算機嗎？

有/沒有



30.



The size of the angle shown is nearest to:

- A 155°
- B 145°
- C 50°
- D 35°
- E 15°

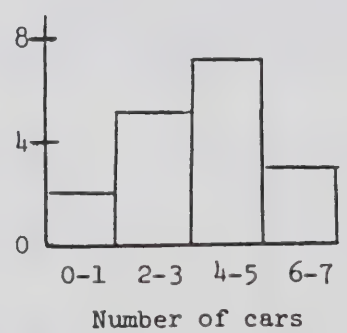
Calculator used? Yes / No

經B鎮到  
E鎮駛回  
的家。如果  
問由A到  
C多少米?

有/沒有

31. Here is a table of data and a graph of the same data. What is  $x$ ?

Number of Cars	Frequency
0 or 1	2
2 or 3	$x$
4 or 5	7
6 or 7	3

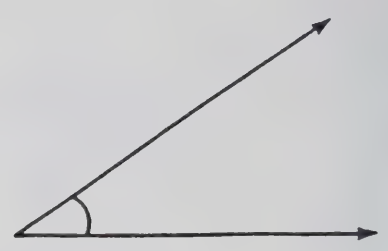


- A 2
- B 3
- C 4
- D 5
- E 6

Calculator used? Yes / No

有/沒有

30.



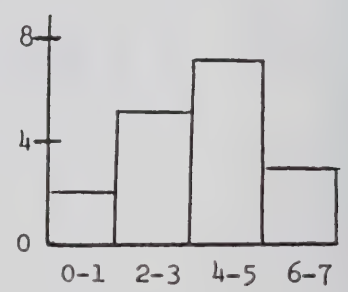
圖中所示的角最接近

- A 155°
- B 145°
- C 50°
- D 35°
- E 15°

有用計算機嗎? 有/沒有

31. 下列是一些數據及它們的圖表。

車輛數目	頻率
0 or 1	2
2 or 3	$x$
4 or 5	7
6 or 7	3



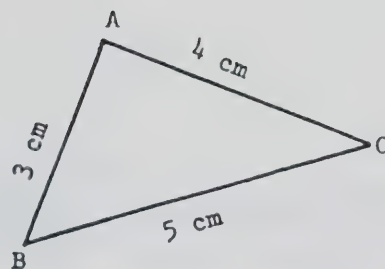
$x$  等於甚麼?

- A 2
- B 3
- C 4
- D 5
- E 6

有用計算機嗎? 有/沒有

車輛數目

32.



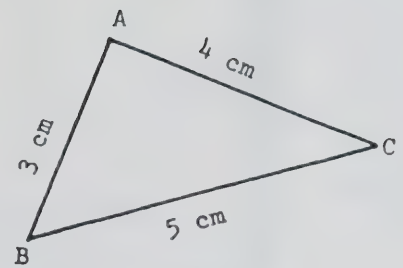
If  $\triangle XYZ$  is a triangle similar to  $\triangle ABC$  but with side  $\overline{YZ}$  10 cm long and side  $\overline{XZ}$  8 cm long, how long is side  $\overline{XY}$ ?

- A 4 cm
- B 5 cm
- C 6 cm
- D 8 cm
- E 9 cm

Calculator used?

Yes / No

32.



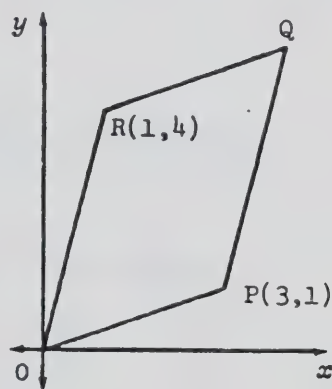
若  $\triangle XYZ$  與  $\triangle ABC$  相似而  $\overline{YZ}$  長 10 cm 及  $\overline{XZ}$  長 8 cm, 問  $\overline{XY}$  長多少?

- A 4 cm
- B 5 cm
- C 6 cm
- D 8 cm
- E 9 cm

有用計算機嗎?

有/沒有

33.



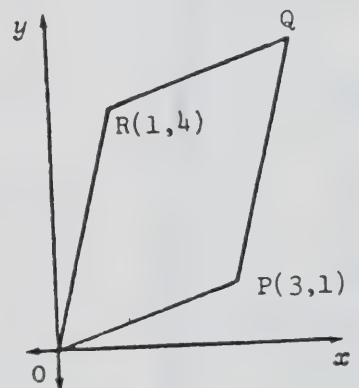
In the diagram,  $OPQR$  is a parallelogram,  $O$  is the origin, the coordinates of point  $P$  are  $(3,1)$  and those of point  $R$  are  $(1,4)$ . What are the coordinates of point  $Q$ ?

- A  $(4,5)$
- B  $(5,4)$
- C  $(3,4)$
- D  $(4,3)$
- E  $(2,7)$

Calculator used?

Yes / No

33.



在圖中,  $OPQR$  是一平行四邊形,  $O$  是原點。  $P$  的坐標是  $(3,1)$  而  $R$  的坐標是  $(1,4)$ 。  $Q$  的坐標是甚麼?

- A  $(4,5)$
- B  $(5,4)$
- C  $(3,4)$
- D  $(4,3)$
- E  $(2,7)$

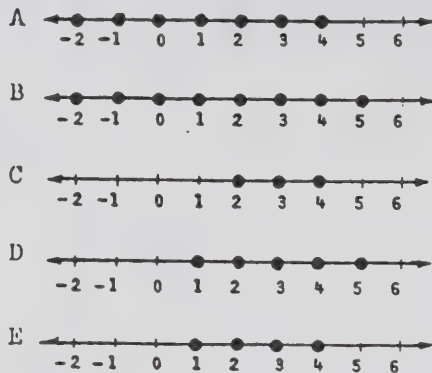
有用計算機嗎?

有/沒有



34.

The set of integers less than 5 is represented on one of the number lines shown below. Which one?

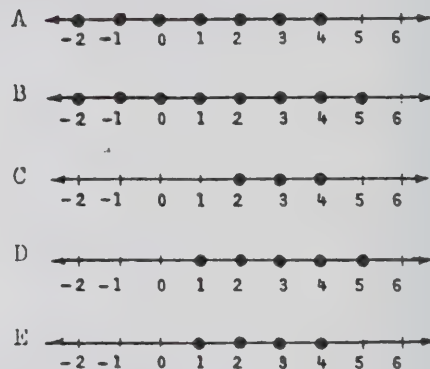


Calculator used?

Yes / No

34.

下列其中一數軸表示比 5 小的整數集。是那一條呢？



有用計算機嗎？

有/沒有

- END -

-完-

$\angle C$

以面  $\overline{YZ}$  長  
 $\overline{XY}$  長多少？

有/沒有



行四邊形, O  
是 (3,1) 而 R  
的坐標是甚麼

有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 5

COGNITIVE TEST

FORM 1/MIDDLE 1 classes

time: 45 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an inter-national test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

A	B	C	D	E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Calculator used? ☒ Yes ☐ No  
 有利用計算機嗎? ☒ 有 ☐ 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的问题。然後，如果你有時間，你可以再答你留空了的问题。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的頂端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

A	B	C	D	E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Calculator used? ☒ Yes ☐ No  
 有利用計算機嗎? ☒ 有 ☐ 沒有



1.

Consider the following reasoning:

- (i)  $1 > 0$   
 (ii) therefore  $2 > 1$   
 (iii) therefore  $2 \times (-1) > 1 \times (-1)$   
 (iv) therefore  $-2 > -1$

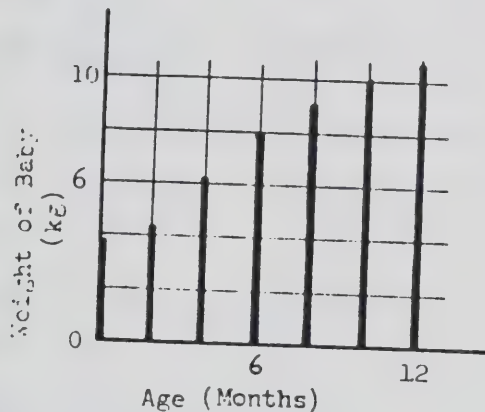
The error, if any, in this reasoning  
**FIRST APPEARS** in

- A line (i)  
 B line (ii)  
 C line (iii)  
 D line (iv)  
 E None of the above--there is  
 no error in this reasoning.

Calculator used?

Yes / No

2.



The weight gain from 6 to 10 months was

- A 1 kg  
 B 2 kg  
 C 4 kg  
 D 6 kg  
 E 8 kg

Calculator used?

Yes / No

1.

考慮下面的推理：

- (i)  $1 > 0$   
 (ii) 所以  $2 > 1$   
 (iii) 所以  $2 \times (-1) > 1 \times (-1)$   
 (iv) 所以  $-2 > -1$

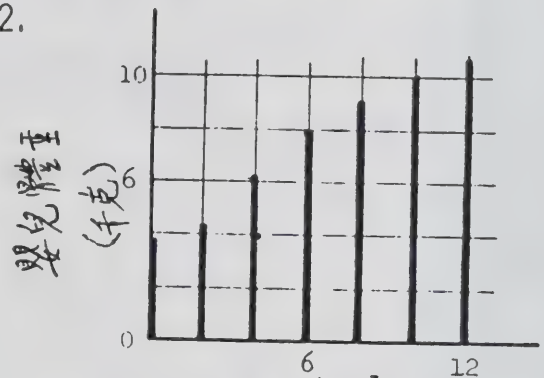
以上推理，如有錯誤的話，那麼錯誤首先出現在

- A 第 (i) 行  
 B 第 (ii) 行  
 C 第 (iii) 行  
 D 第 (iv) 行  
 E 以上都不是，推理沒有錯誤

有用計算機嗎？

有 / 沒有

2.



由六月開始到十月期間  
 體重增加是

- A 1 千克  
 B 2 千克  
 C 4 千克  
 D 6 千克  
 E 8 千克

有用計算機嗎？

有 / 沒有

3.

On a number line two points A and B are given. The coordinate of A is -3 and the coordinate of B is +7. What is the coordinate of the point C, if B is the midpoint of the line segment  $\overline{AC}$ ?

- A -13
- B  $-\frac{1}{2}$
- C +2
- D +12
- E +17

Calculator used?

Yes / No

3.

在一數線上已知兩點 A 及 B。  
A 的坐標為 -3 而 B 的坐標是 +7。如果 B 是線段  $\overline{AC}$  的中點，C 的坐標是甚麼？

- A -13
- B  $-\frac{1}{2}$
- C +2
- D +12
- E +17

有用計算機嗎？

有 / 沒有

4.

$$.004 \overline{)24.56}$$

In the division above, the correct answer is

- A 0.614
- B 6.14
- C 61.4
- D 614
- E 6140

Calculator used?

Yes / No

4.

$$.004 \overline{)24.56}$$

在上面除數中，正確答案是

- A 0.614
- B 6.14
- C 61.4
- D 614
- E 6140

有用計算機嗎？

有 / 沒有

5.

How many pieces of pipe each 20 meters long would be required to construct a pipeline 1 kilometer in length?

- A 5
- B 50
- C 500
- D 5000
- E 50,000

Calculator used?

Yes / No

5.

要建造一條一仟米長的輸水管，需要多少條 20 米的水管？

- A 5
- B 50
- C 500
- D 5000
- E 50,000

有用計算機嗎？

有 / 沒有

6.

What is the capacity of a cubic container 10 cm by 10 cm by 10 cm?

- A 1 liter
- B 10 liters
- C 100 liters
- D 1000 liters
- E 1000 centimeters

Calculator used? Yes / No

6.

一個 10 厘米乘 10 厘米乘 10 厘米的立體容器的容量是多少?

- A 1 公斤
- B 10 公斤
- C 100 公斤
- D 1000 公斤
- E 1000 厘米

有用計算機嗎? 有/沒有

7. If two triangles are SIMILAR, which of the following statements is TRUE?

- A Their corresponding angles MUST be congruent.
- B Their corresponding sides MUST be congruent.
- C Their corresponding sides MUST be parallel
- D They MUST have the same area
- E They MUST have the same shape and size

Calculator used? Yes / No

7. 如果兩個三角形相似, 下列那句子是真的?

- A 它們對應的角一定要全等
- B 它們對應的邊一定要全等
- C 它們對應的邊一定要平行
- D 它們一定要有相同的面積
- E 它們一定要有相同的形狀和大小

有用計算機嗎? 有/沒有

8.

A team scores an average of 3 points per game over 5 games. How many points altogether were scored in the 5 games?

- A  $\frac{3}{5}$
- B  $\frac{5}{3}$
- C 3
- D 5
- E 15

Calculator used? Yes / No

8. 一隊球隊在 5 場比賽中平均每場得 3 分, 在這 5 場比賽中共得多少分?

- A  $\frac{3}{5}$
- B  $\frac{5}{3}$
- C 3
- D 5
- E 15

有用計算機嗎? 有, 沒有



9.

Which of the following is (are) true?

- I  $(53 \times 73) \times 17 = 53 \times (73 \times 17)$   
 II  $133 \times (78 + 89) = (133 \times 78) + 89$   
 III  $133 \times (78 + 89) = (133 \times 78) + (133 \times 89)$

- A I only  
 B II only  
 C III only  
 D I and II only  
 E I and III only

Calculator used?

Yes / No

10.

There are 7,000,000 girls under the age of 21 in a country with a total population of 36,000,000. If a circle graph were drawn showing the distribution of the population, the angle in the sector representing girls under the age of 21 would be

- A  $7^\circ$   
 B  $20^\circ$   
 C  $21^\circ$   
 D  $70^\circ$   
 E  $72^\circ$

Calculator used?

Yes / No

11.

The length of a box was measured and found to be 9 centimeters TO THE NEAREST CENTIMETER. Which of these could have been the length of the box measured more accurately?

- A 10 cm  
 B 9.9 cm  
 C 9.62 cm  
 D 9.6 cm  
 E 8.6 cm

Calculator used?

Yes / No

9.

下面那些句子是真的?

- I  $(53 \times 73) \times 17 = 53 \times (73 \times 17)$   
 II  $133 \times (78 + 89) = (133 \times 78) + 89$   
 III  $133 \times (78 + 89) = (133 \times 78) + (133 \times 89)$

- A 祇有 I  
 B 祇有 II  
 C 祇有 III  
 D 祇有 I 及 II  
 E 祇有 I 及 III

有用計算機嗎?

有/沒有

10.

某國家總人口 36,000,000, 而 21 歲以下女童佔 7,000,000。如果現在繪一個圓形圖表顯示人口的分佈, 代表 21 歲以下女童的扇形角度是

- A  $7^\circ$   
 B  $20^\circ$   
 C  $21^\circ$   
 D  $70^\circ$   
 E  $72^\circ$

有用計算機嗎?

有/沒有

11.

一個箱子的長度是 9 厘米 (以最接近的整數厘米計算)。下列那一個可能是箱子長度較精確的長度?

- A 10 cm  
 B 9.9 cm  
 C 9.62 cm  
 D 9.6 cm  
 E 8.6 cm

有用計算機嗎?

有/沒有

12.

In a discus-throwing competition, the winning throw was 61.60 meters. The second place throw was 59.72 meters. How much longer was the winning throw than the second place throw?

- A 1.12 meters
- B 1.88 meters
- C 1.92 meters
- D 2.12 meters
- E 121.32 meters

Calculator used?

Yes / No

12.

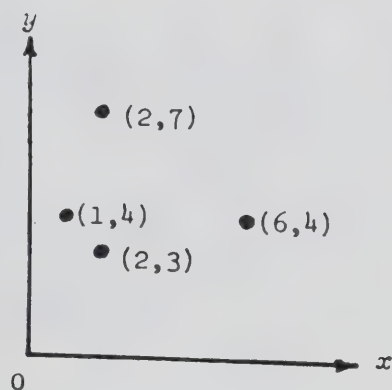
在一擲鐵餅比賽中，冠軍的一擲是 61.60 米，亞軍的一擲是 59.72 米。冠軍比亞軍所擲的遠多少？

- A 1.12 米
- B 1.88 米
- C 1.92 米
- D 2.12 米
- E 121.32 米

有用計算機嗎？

有/沒有

13.



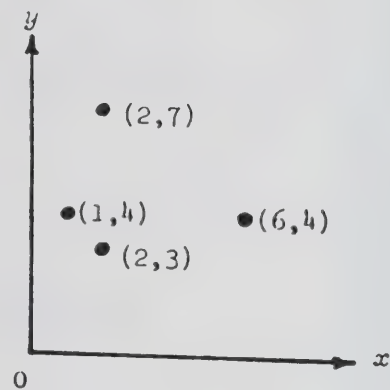
The straight line joining the points (2,3) and (2,7) cuts the straight line joining the points (1,4) and (6,4) at the point

- A (4,2)
- B (1,4)
- C (1,3)
- D (2,3)
- E (2,4)

Calculator used?

Yes / No

13.



連接 (2,3) 及 (2,7) 的直線和連接 (1,4) 及 (6,4) 的直線相交於

- A (4,2)
- B (1,4)
- C (1,3)
- D (2,3)
- E (2,4)

有用計算機嗎？

有/沒有

14.

The petals on 100 flowers of different kinds were carefully counted, and the results are shown in this table.

No. of petals	Frequency
10-12	5
13-15	22
16-18	48
19-21	18
22-24	7

How many of the flowers had fewer than 19 petals?

- A 48  
B 52  
C 73  
D 75  
E 93

Calculator used?

Yes / No

15.

If  $x = y = z = 1$ ,

then  $\frac{x-z}{x+y}$  is equal to

- A -2  
B -1  
C 0  
D  $\frac{1}{2}$   
E 1

Calculator used?

Yes / No

14.

100 朵不同花朵的花瓣經小心數過, 其結果列在下表內。

花瓣數目	頻率
10-12	5
13-15	22
16-18	48
19-21	18
22-24	7

有多少花朵是少於 19 頁花瓣的?

- A 48  
B 52  
C 73  
D 75  
E 93

有用計算機嗎?

有 / 沒有

15.

若  $x = y = z = 1$ ,  
則  $\frac{x-z}{x+y}$  等於

- A -2  
B -1  
C 0  
D  $\frac{1}{2}$   
E 1

有用計算機嗎?

有 / 沒有



16.

 $1\frac{2}{5} - \frac{1}{2}$  is equal to

A  $\frac{2}{3}$

B  $\frac{9}{10}$

C  $1\frac{1}{10}$

D  $1\frac{1}{7}$

E  $1\frac{1}{3}$

Calculator used?

Yes / No

16.

 $1\frac{2}{5} - \frac{1}{2}$  等於

A  $\frac{2}{3}$

B  $\frac{9}{10}$

C  $1\frac{1}{10}$

D  $1\frac{1}{7}$

E  $1\frac{1}{3}$

有用計算機嗎? 有/沒有

17.

 If  $y = 2x - 5$  and  $x = 2$ , then  
 $y$  is equal to

A 9

B 6

C 1

D -1

E -6

Calculator used?

Yes / No

17.

 若  $y = 2x - 5$  及  $x = 2$ ,  
 $y$  等於

A 9

B 6

C 1

D -1

E -6

有用計算機嗎? 有/沒有

18.

Which of the indicated angles is ACUTE?

18.

下面那一角是銳角？

A



B



C



D



E

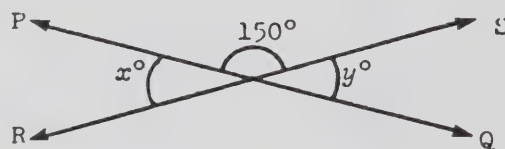


Calculator used?

Yes / No

有用計算機嗎？ 有/沒有

19.



If, in the given figure,  $\overleftrightarrow{PQ}$  and  $\overleftrightarrow{RS}$  are intersecting straight lines, then  $x + y$  is equal to

A 15

B 30

C 60

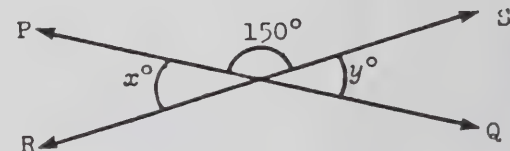
D 180

E 300

Calculator used?

Yes / No

19.



上圖中  $\overleftrightarrow{PQ}$  及  $\overleftrightarrow{RS}$  為相交的直線。  
 $x + y$  等於

A 15

B 30

C 60

D 180

E 300

有用計算機嗎？

有/沒有

20.

In a school election with three candidates, Joe received 120 votes. Mary received 50 votes, and George received 30 votes. What percent of the total number of votes did Joe receive?

- A  $\frac{6}{10}\%$   
 B 40%  
 C 60%  
 D 80%  
 E 120%

Calculator used?

Yes / No

20.

在某次學校選舉共有三個候選人。阿祖得到 120 票，瑪莉得 50 票，佐治得 30 票。祖得全部票數的百分率為何？

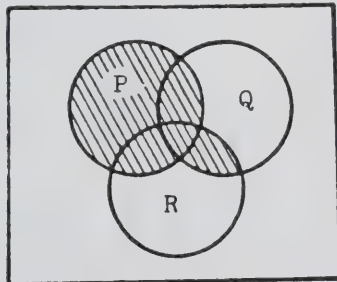
- A  $\frac{6}{10}\%$   
 B 40%  
 C 60%  
 D 80%  
 E 120%

有用計算機嗎？

有/沒有

21.

The symbol  $P \cap Q$  represents the intersection of sets P and Q and the symbol  $P \cup Q$  represents the union of sets P and Q. Which of the following represents the shaded portion of the diagram below?



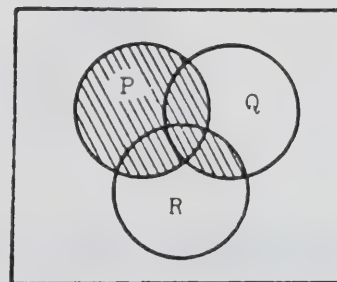
- A  $(P \cap Q) \cup R$   
 B  $P \cup (Q \cap R)$   
 C  $P \cap (Q \cup R)$   
 D  $(P \cap Q) \cap R$   
 E  $(P \cup Q) \cap R$

Calculator used?

Yes / No

21.

$P \cap Q$  表示 P 與 Q 的交集，  
 $P \cup Q$  表示 P 與 Q 的聯集。  
 下列那一個集表示圖中陰影部份？



- A  $(P \cap Q) \cup R$   
 B  $P \cup (Q \cap R)$   
 C  $P \cap (Q \cup R)$   
 D  $(P \cap Q) \cap R$   
 E  $(P \cup Q) \cap R$

有用計算機嗎？

有/沒有



22.

 $3.23 \times 10^5$  is equal to

- A 0.0000323  
 B 3.23000  
 C 32,300  
 D 323,000  
 E 32,300,000

Calculator used?

Yes / No

22.

 $3.23 \times 10^5$  等於

- A 0.0000323  
 B 3.23000  
 C 32,300  
 D 323,000  
 E 32,300,000

有用計算機嗎？

有/沒有

23.

 $(-6) - (-8)$  is equal to

- A 14  
 B 2  
 C -2  
 D -10  
 E -14

Calculator used?

Yes / No

23.

 $(-6) - (-8)$  等於

- A 14  
 B 2  
 C -2  
 D -10  
 E -14

有用計算機嗎？

有/沒有

24.

Find the value of N.

$$N = 10^3 + 10^1 + 10^0 + 10^{-2}$$

- A  $N = 0$   
 B  $N = 20$   
 C  $N = 1011.01$   
 D  $N = 100$   
 E Some other value

Calculator used?

Yes / No

24.

求 N 之值：

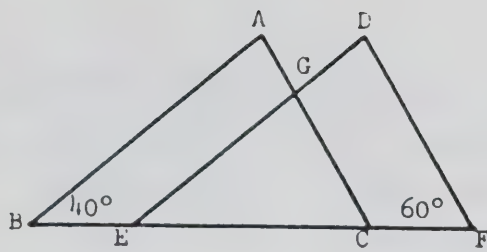
$$N = 10^3 + 10^1 + 10^0 + 10^{-2}$$

- A  $N = 0$   
 B  $N = 20$   
 C  $N = 1011.01$   
 D  $N = 100$   
 E 另有其它数值

有用計算機嗎？

有/沒有

25.



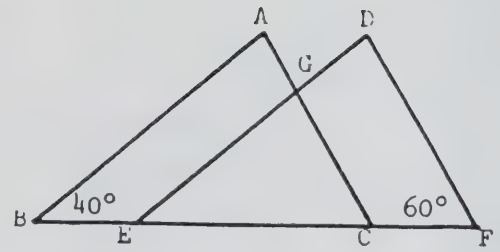
In the above diagram, triangles ABC and DEF are congruent, with  $BC = EF$ . What is the measure of angle EGC?

- A  $20^\circ$   
 B  $40^\circ$   
 C  $60^\circ$   
 D  $80^\circ$   
 E  $100^\circ$

Calculator used?

Yes / No

25.



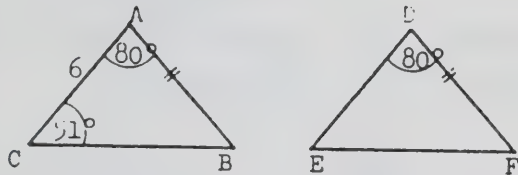
在上圖中三角形 ABC 與三角形 DEF 全等，  
 $BC = EF$ ，角 EGC 的值是多少？

- A  $20^\circ$   
 B  $40^\circ$   
 C  $60^\circ$   
 D  $80^\circ$   
 E  $100^\circ$

有用計算機嗎？

有/沒有

26.



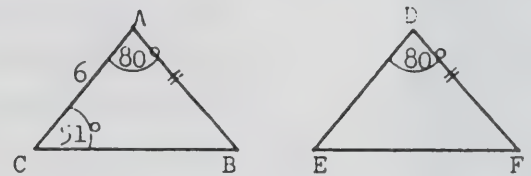
If the triangles above are congruent and  $m\angle A = m\angle D = 80^\circ$ ,  $m\angle C = 51^\circ$  and  $AB \cong DF$ , which of these is TRUE?

- A  $m\angle F = 49^\circ$  and  $\overline{ED}$  is 6 units long  
 B  $m\angle F = 49^\circ$  and  $\overline{FD}$  is 6 units long  
 C  $m\angle F = 49^\circ$  and  $\overline{EF}$  is 6 units long  
 D  $m\angle F = 51^\circ$  and  $\overline{ED}$  is 6 units long  
 E  $m\angle F = 51^\circ$  and  $\overline{FD}$  is 6 units long

Calculator used?

Yes / No

26.



如果上圖的兩個三角形全等而  
 $m\angle A = m\angle D = 80^\circ$ ,  $m\angle C = 51^\circ$  及  
 $AB \cong DF$ ，下面那句是真的？

- A  $m\angle F = 49^\circ$  及  $\overline{ED}$  是 6 單位長  
 B  $m\angle F = 49^\circ$  及  $\overline{FD}$  是 6 單位長  
 C  $m\angle F = 49^\circ$  及  $\overline{EF}$  是 6 單位長  
 D  $m\angle F = 51^\circ$  及  $\overline{ED}$  是 6 單位長  
 E  $m\angle F = 51^\circ$  及  $\overline{FD}$  是 6 單位長

有用計算機嗎？

有/沒有

27.

In a quadrilateral, two of the angles each have measure of  $110^\circ$ , and the measure of a third angle is  $90^\circ$ . What is the measure of the remaining angle?

- A  $50^\circ$   
 B  $90^\circ$   
 C  $130^\circ$   
 D  $140^\circ$   
 E None of the above

Calculator used?

Yes / No

28.

"Six times a certain number (call it  $q$ ) equals the sum of eight and twice the number." This can be written as

- A  $6q = 2(8 + q)$   
 B  $6(q + 8) = 2q$   
 C  $6(q + 8) = 8 + 2q$   
 D  $6q = 8 + 2q$   
 E  $q = 1$

Calculator used?

Yes / No

27.

在一個四邊形內，其中兩角為  $110^\circ$ ，第三角為  $90^\circ$ ，餘下的一個是多少？

- A  $50^\circ$   
 B  $90^\circ$   
 C  $130^\circ$   
 D  $140^\circ$   
 E 以上都不是

有用計算機嗎？ 有 / 沒有

28.

"某數(稱它為  $q$ )的六倍等於兩倍此數及八之和"。這句可寫為

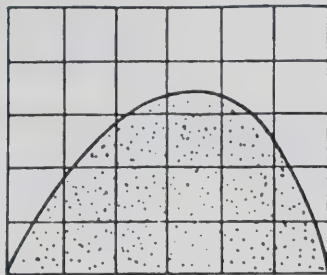
- A  $6q = 2(8 + q)$   
 B  $6(q + 8) = 2q$   
 C  $6(q + 8) = 8 + 2q$   
 D  $6q = 8 + 2q$   
 E  $q = 1$

有用計算機嗎？

有 / 沒有



29.



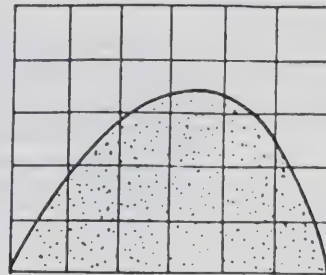
Each of the small squares in the figure is 1 square unit. Which is the best estimate of the area of the shaded region?

- A 10 square units
- B 12 square units
- C 14 square units
- D 16 square units
- E 18 square units

Calculator used?

Yes / No

29.



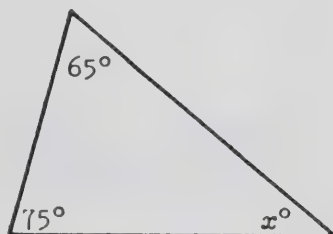
上圖的小正方形是1平方單位。下面那項是陰影面積的最佳估計？

- A 10 平方單位
- B 12 平方單位
- C 14 平方單位
- D 16 平方單位
- E 18 平方單位

有用計算機嗎？

有/沒有

30.



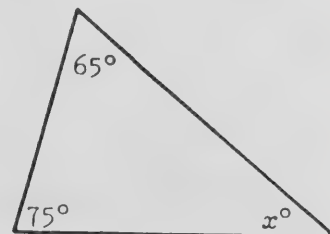
$x$  is equal to

- A 75
- B 70
- C 65
- D 60
- E 40

Calculator used?

Yes / No

30.



$x$  等於

- A 75
- B 70
- C 65
- D 60
- E 40

有用計算機嗎？

有/沒有

中兩角皆  
餘下的一

沒有

倍等於  
這句

有/沒有

31.

Peter and Paul decided to start saving money. Peter can save 3 dollars each month and Paul can save 5 dollars. At this rate, after how many months will Paul have exactly 10 dollars more than Peter?

- A 2
- B 3
- C 4
- D 5
- E 8

Calculator used? Yes / No

31.

彼得和保羅決定開始儲蓄。  
彼得每月可儲3元，保羅則可儲5元。以此速率，要經過多少月後保羅才可比彼得多10元？

- A 2
- B 3
- C 4
- D 5
- E 8

有用計算機嗎？ 有 / 沒有

32.

If  $x = -3$ , the value of  $-3x$  is

- A -9
- B -6
- C -1
- D 1
- E 9

Calculator used? Yes / No

32.

若  $x = -3$ ，則  $-3x$  之值是

- A -9
- B -6
- C -1
- D 1
- E 9

有用計算機嗎？ 有 / 沒有

33.

Which of the following equals  $7 \times (3 + 9)$ ?

- A  $(7 \times 3) + (7 \times 9)$
- B  $(7 \times 9) + (3 \times 9)$
- C  $(7 \times 3) + (3 \times 9)$
- D  $7 \times 27$
- E  $21 + 9$

Calculator used? Yes / No

33.

下列那一項等於

$$7 \times (3 + 9) ?$$

- A  $(7 \times 3) + (7 \times 9)$
- B  $(7 \times 9) + (3 \times 9)$
- C  $(7 \times 3) + (3 \times 9)$
- D  $7 \times 27$
- E  $21 + 9$

有用計算機嗎？ 有 / 沒有

34.

$\frac{x}{2} < 7$  is equivalent to

A  $x < \frac{7}{2}$

B  $x < 5$

C  $x < 14$

D  $x > 5$

E  $x > 14$

Calculator used?

Yes / No

- END -

34.

$\frac{x}{2} < 7$  相當於

A  $x < \frac{7}{2}$

B  $x < 5$

C  $x < 14$

D  $x > 5$

E  $x > 14$

有用計算機嗎?

有/沒有

- 完 -

台信諸蓄  
匯則可儲  
區多少月  
10元?

沒有

是

沒有

有/沒有





INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 6

COGNITIVE TEST

FORM 1/MIDDLE 1 classes

time: 45 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

A	B	C	D	E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Calculator used? ☒ Yes ☐ No  
 有利用計算機嗎? ☒ 有 ☐ 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的，所以你會對某些問題不太熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的问题。然後，如果你有時間，你可以再答你留空了的问题。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的頂端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

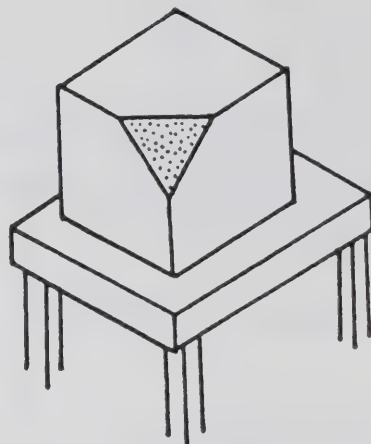
正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

A	B	C	D	E
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Calculator used? ☒ Yes ☐ No  
 有利用計算機嗎? ☒ 有 ☐ 沒有

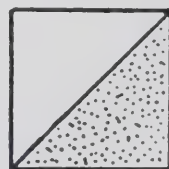
1.



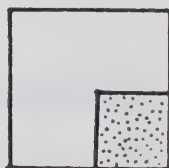
The figure above shows a wooden cube with one corner cut off and shaded. Which of the following drawings shows how this cube would look when viewed from directly above it?

上圖顯示一個被批去一角的正立方體。若從它的上空向下觀看它，所見的圖形會與下列那一個圖形相符合？

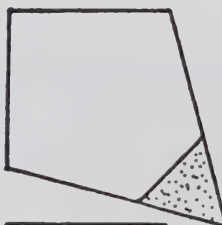
A



B



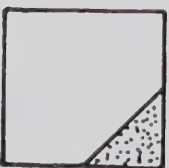
C



D



E



Calculator used?

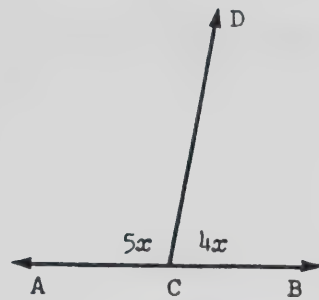
Yes / No

有用計算機嗎？

有/沒有



2.



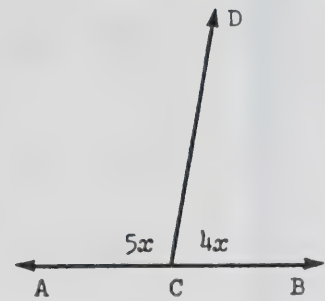
If AB is a straight line, what is the measure in degrees of angle BCD?

- A 20
- B 40
- C 50
- D 80
- E 100

Calculator used?

Yes / No

2.



如 AB 是一直線, 則角 BCD 是幾多度?

- A 20
- B 40
- C 50
- D 80
- E 100

有用計算機嗎?

有/沒有

3.

The speed of sound is approximately 340 meters per second. How long will it take before the sound of a car horn reaches your ears if the car is 714 meters away?

- A 0.21 seconds
- B 2.1 seconds
- C 21 seconds
- D 210 seconds
- E None of these

Calculator used?

Yes / No

3.

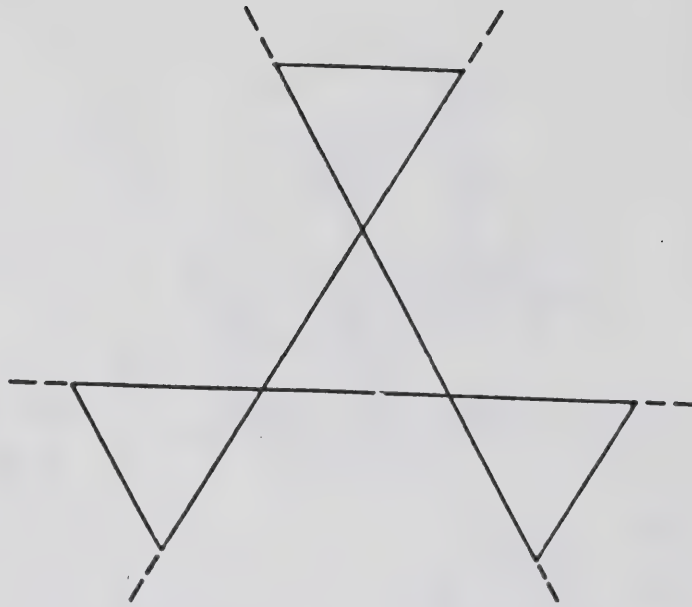
聲音的速度大約是每秒 340 米。如果一輛汽車距離你 714 米, 要多少時間汽車的响號才會到達你的耳朵?

- A 0.21 秒
- B 2.1 秒
- C 21 秒
- D 210 秒
- E 以上都不是

有用計算機嗎?

有/沒有

4.



Four identical equilateral triangles have been arranged as shown above. How many lines of symmetry does the resulting figure have?

- A 1  
B 3  
C 6  
D 9  
E 12

Calculator used?

Yes / No

5. Find the sum:

$$\begin{array}{r} 3 \text{ weeks } 5 \text{ days} \\ + 9 \text{ weeks } 6 \text{ days} \\ \hline \end{array}$$

- A 12 weeks 1 day  
B 12 weeks 4 days  
C 13 weeks 1 day  
D 13 weeks 4 days  
E 13 weeks 11 days

Calculator used?

Yes / No

上圖顯示四個全等正三角形的排列。這圖有多少條對稱軸？

- A 1  
B 3  
C 6  
D 9  
E 12

有用計算機嗎？

有/沒有

5. 求下列的和：

$$\begin{array}{r} 3 \text{ 星期 } 5 \text{ 日} \\ + 9 \text{ 星期 } 6 \text{ 日} \\ \hline \end{array}$$

- A 12 星期 1 日  
B 12 星期 4 日  
C 13 星期 1 日  
D 13 星期 4 日  
E 13 星期 11 日

有用計算機嗎？

有/沒有

BCD

有/沒有

子秒 340  
離你  
氣車的  
的耳朵？

有/沒有

6.

$7\frac{3}{20}$  is equal to

A 7.03

B 7.15

C 7.23

D 7.3

E 7.6

Calculator used?

Yes / No

7.

If there are 300 calories in 100 grams of a certain food, how many calories are there in a 30 gram portion of that food?

A 90

B 100

C 900

D 1000

E 9000

Calculator used?

Yes / No

6.

$7\frac{3}{20}$  等於

A 7.03

B 7.15

C 7.23

D 7.3

E 7.6

有用計算機嗎?

有/沒有

7.

某食物每 100 克含 300 加路里, 問此食物 30 克含若干加路里?

A 90

B 100

C 900

D 1000

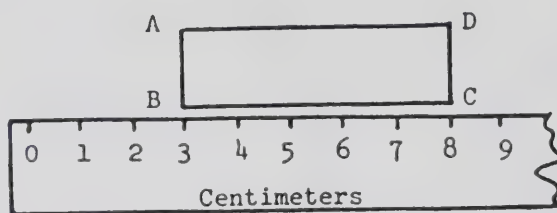
E 9000

有用計算機嗎?

有/沒有



8.



According to the scale shown, the length of side BC of a rectangle ABCD (to the NEAREST CENTIMETER) is

- A 5 centimeters
- B 6 centimeters
- C 7 centimeters
- D 8 centimeters
- E 9 centimeters

Calculator used?

Yes / No

9.

There are 227 students in a school. Every student in the school belongs to either the music club or the sports club, and some students belong to both clubs. The music club has 120 members, and 36 of these are also members of the sports club. What is the total membership of the sports club?

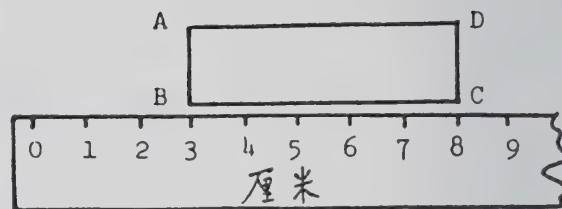
- A 36
- B 84
- C 107
- D 120
- E 143

Calculator used?

Yes / No

6

8.



根據上圖所顯示的刻度，長方形 ABCD 的邊 BC 長 (以最接近的整數厘米計) 是

- A 5 厘米
- B 6 厘米
- C 7 厘米
- D 8 厘米
- E 9 厘米

有用計算機嗎?

有/沒有

9.

一學校有 227 學生。每一個學生隸屬音樂學會或體育學會，而有些學生則同時隸屬這兩個學會。音樂學會有 120 會員，而其中 36 人同時隸屬體育學會。問體育學會有多少會員?

- A 36
- B 84
- C 107
- D 120
- E 143

有用計算機嗎?

有/沒有

D

有/沒有

合 300  
克 含 若

有/沒有

10.

 $12x + 16y$  is equal to

- A  $12(x + 16y)$   
 B  $4(3x + 4y)$   
 C  $4(3x + 6y)$   
 D  $2(6x + 16y)$   
 E  $12(x + 4y)$

Calculator used?

Yes / No

10.

 $12x + 16y$  等於

- A  $12(x + 16y)$   
 B  $4(3x + 4y)$   
 C  $4(3x + 6y)$   
 D  $2(6x + 16y)$   
 E  $12(x + 4y)$

有用計算機嗎?

有/沒有

11.

There are five black buttons and one red button in a jar. If you pull out one button at random, what is the probability that you will get the red button?

- A 0  
 B  $\frac{1}{6}$   
 C  $\frac{1}{5}$   
 D  $\frac{5}{6}$   
 E 1

Calculator used?

Yes / No

11.

一瓶中有五粒黑鈕及一粒紅鈕。如果你隨意抽出一粒鈕，問你得到紅鈕的概率是多少?

- A 0  
 B  $\frac{1}{6}$   
 C  $\frac{1}{5}$   
 D  $\frac{5}{6}$   
 E 1

有用計算機嗎?

有/沒有

12.  $(-\frac{3}{4}) - (-\frac{1}{8})$  is equal to

- A  $-\frac{7}{8}$   
 B  $-\frac{5}{8}$   
 C  $-\frac{3}{8}$   
 D  $\frac{5}{8}$   
 E  $\frac{7}{8}$

Calculator used?

Yes / No

12.  $(-\frac{3}{4}) - (-\frac{1}{8})$  等於

- A  $-\frac{7}{8}$   
 B  $-\frac{5}{8}$   
 C  $-\frac{3}{8}$   
 D  $\frac{5}{8}$   
 E  $\frac{7}{8}$

有用計算機嗎?

有/沒有

13.

 $\sqrt{75}$  is between

- A 4 and 5  
B 5 and 6  
C 6 and 7  
D 7 and 8  
E 8 and 9

Calculator used?

Yes / No

有 / 沒有

14.

A group of children was divided into 7 teams with nine in each team. Later, the same group of children was divided into teams with seven in each team. How many teams were there then?

- A 7  
B 8  
C 9  
D 16  
E 63

Calculator used?

Yes / No

有 / 沒有

15.

$$\frac{\frac{3}{5}}{\frac{2}{7}}$$

is equal to

- A  $\frac{21}{10}$   
B  $\frac{5}{12}$   
C  $\frac{10}{21}$   
D  $\frac{6}{35}$   
E  $\frac{31}{35}$

Calculator used?

Yes / No

有 / 沒有

13.

 $\sqrt{75}$  是在

- A 4 與 5 之間  
B 5 與 6 之間  
C 6 與 7 之間  
D 7 與 8 之間  
E 8 與 9 之間

有用計算機嗎?

有 / 沒有

14.

一群小孩被分為 7 隊, 每隊九人。後來, 同一群小孩被分為若干隊, 每隊七人。這時有多少隊呢?

- A 7  
B 8  
C 9  
D 16  
E 63

有用計算機嗎?

有 / 沒有

15.

$$\frac{\frac{3}{5}}{\frac{2}{7}}$$

等於

- A  $\frac{21}{10}$   
B  $\frac{5}{12}$   
C  $\frac{10}{21}$   
D  $\frac{6}{35}$   
E  $\frac{31}{35}$

有用計算機嗎?

有 / 沒有



16.

One bell rings every 8 minutes, a second bell rings every 12 minutes. They both ring at exactly 12 o'clock. In how many minutes will they next ring together?

- A 8
- B 12
- C 20
- D 24
- E 96

Calculator used?

Yes / No

16.

一鈴每 8 分鐘响一次, 另一鈴則每 12 分鐘响一次。在 12 時正它們一齊响, 問要過多少分鐘它們會再次一齊响?

- A 8
- B 12
- C 20
- D 24
- E 96

有用計算機嗎?

有/沒有

17.

A solid plastic cube with edges 1 centimeter long weighs 1 gram. How much will a solid cube of the same plastic weigh if each edge is 2 centimeters long?

- A 8 grams
- B 4 grams
- C 3 grams
- D 2 grams
- E 1 gram

Calculator used?

Yes / No

17.

一個塑膠立方體每邊長 1 厘米, 重 1 克。問用同樣塑膠造的而每邊長 2 厘米的立方體有多重?

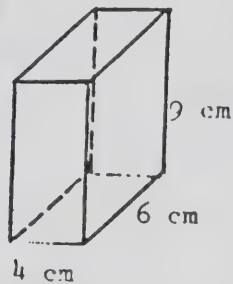
- A 8 克
- B 4 克
- C 3 克
- D 2 克
- E 1 克

有用計算機嗎?

有/沒有

18.

What is the SURFACE AREA of this solid rectangular box?



- A 50 square centimeters
- B 100 square centimeters
- C 114 square centimeters
- D 216 square centimeters
- E 228 square centimeters

Calculator used?

Yes / No

19.

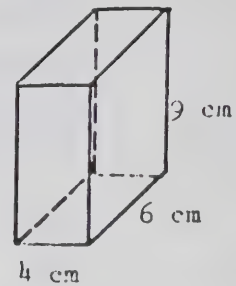
Which of the following is FALSE when  $a$ ,  $b$ , and  $c$  are different real numbers?

- A  $(a + b) + c = a + (b + c)$
- B  $ab = ba$
- C  $a + b = b + a$
- D  $(ab)c = a(bc)$
- E  $a - b = b - a$

Calculator used?

Yes / No

18. 這長方體的表面面積是多少?



- A 50 平方厘米
- B 100 平方厘米
- C 114 平方厘米
- D 216 平方厘米
- E 228 平方厘米

有用計算機嗎?

有/沒有

19. 當  $a$ ,  $b$ ,  $c$  為不同的實數時, 下列那句是錯的?

- A  $(a + b) + c = a + (b + c)$
- B  $ab = ba$
- C  $a + b = b + a$
- D  $(ab)c = a(bc)$
- E  $a - b = b - a$

有用計算機嗎?

有/沒有

D

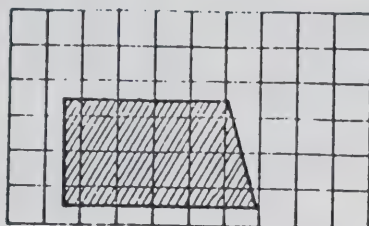
有/沒有

另一鈴  
在 12  
要過多  
齊响?

有/沒有

長 1 厘  
長塑膠  
的立方

20.


☐ 1 square unit

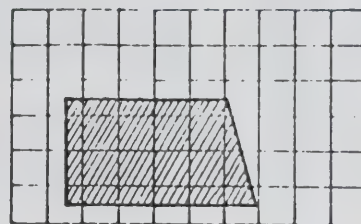
The area of the shaded figure, to the nearest square unit, is

- A 23 square units
- B 20 square units
- C 18 square units
- D 15 square units
- E 12 square units

Calculator used?

Yes / No

20.


☐ 一平方單位

圖中陰影所示的面積, 以最接近的數平方單位計, 是

- A 23 平方單位
- B 20 平方單位
- C 18 平方單位
- D 15 平方單位
- E 12 平方單位

有用計算機嗎?

有/沒有

21.

A bowling ball travels 4 meters per second. The distance in meters traveled in  $t$  seconds is given by  $d=4t$ . In the table below  $x$  is equal to

$t$	$d$
0	0
1	4
2	8
3	$x$
4	16

- A 6
- B 10
- C 12
- D 14
- E None of these

Calculator used?

Yes / No

21.

一個保齡球每秒行 4 米。  
在  $t$  秒中所行的距離為  
 $d=4t$ 。在下表中,  $x$  等於:

$t$	$d$
0	0
1	4
2	8
3	$x$
4	16

- A 6
- B 10
- C 12
- D 14
- E 以上都不是

有用計算機嗎?

有/沒有



22.

Which of the following operations with whole numbers will ALWAYS give a whole number?

- I Addition  
II Multiplication  
III Division

- A I only  
B II only  
C III only  
D I and II only  
E II and III only

Calculator used?

Yes / No

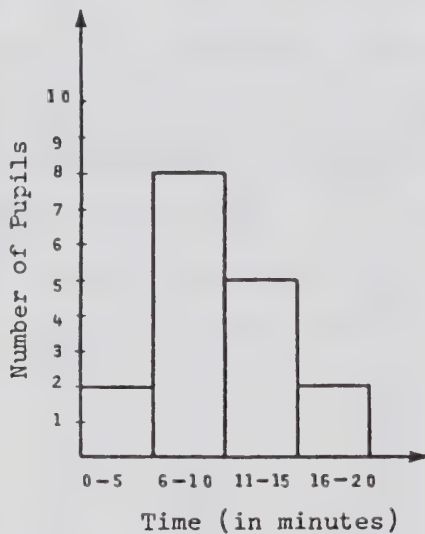
22. 在整數的運算中,下列那一  
運算方法必得出整數?

- I 加法  
II 乘法  
III 除法

- A 祇有 I  
B 祇有 II  
C 祇有 III  
D 祇有 I 和 II  
E 祇有 II 和 III

有用計算機嗎?

有/沒有



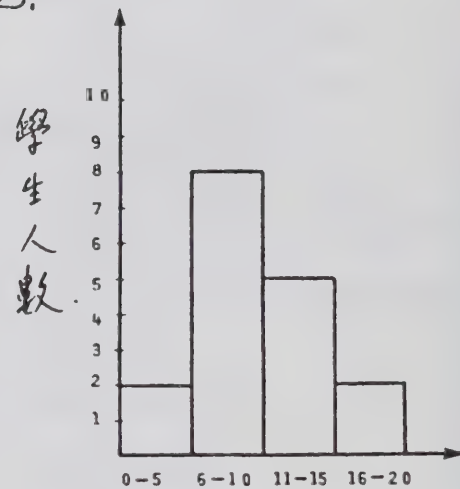
The graph shows the time of travel by pupils from home to school. How many pupils must travel for MORE than 10 minutes?

- A 2  
B 5  
C 7  
D 8  
E 15

Calculator used?

Yes / No

23.



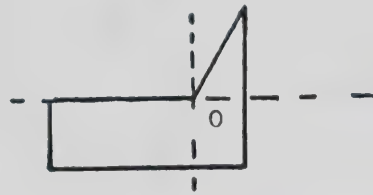
上圖所示為一群學生從家返  
學校所需的時間。問有多少  
學生從家返學校的時間多過10分鐘?

- A 2  
B 5  
C 7  
D 8  
E 15

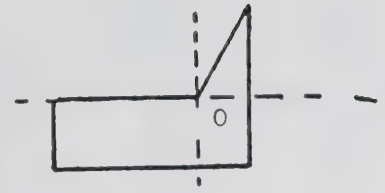
有用計算機嗎?

有/沒有

24.

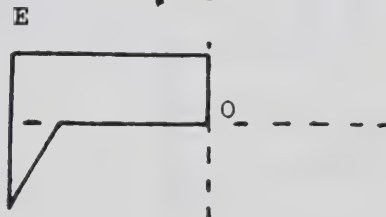
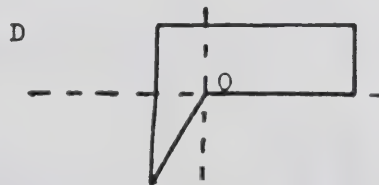
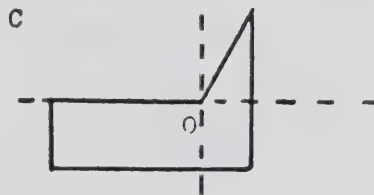
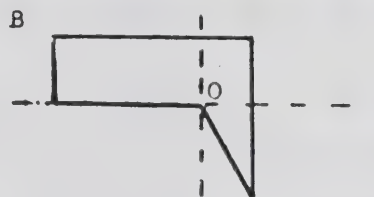
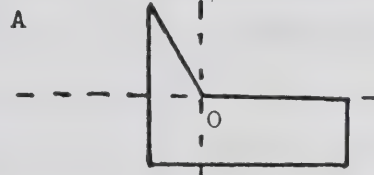


24.



A half-turn about O is applied to the figure above. Which of the figures below is the result?

以上圖形對O作一半旋轉。  
下列那一個是旋轉後的結果？



Calculator used?

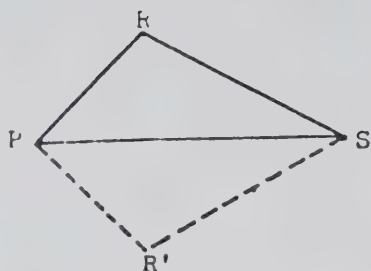
Yes / No

有用計算機嗎？

有/沒有

D

25.



If  $\triangle PRS$  maps onto  $\triangle PR'S$  under a reflection (flip) over line  $\overline{PS}$ , which of these statements about lengths must be true?

- A length of  $\overline{PS}$  = length of  $\overline{PR}$  plus length of  $\overline{PR'}$
- B length of  $\overline{RS}$  = length of  $\overline{PR'}$
- C length of  $\overline{PR}$  = length of  $\overline{R'S}$
- D length of  $\overline{R'R}$  = length of  $\overline{PS}$
- E length of  $\overline{PR}$  = length of  $\overline{PR'}$

Calculator used?

Yes / No

26.

$x$	3	6	P
$y$	7	Q	35

The table above shows the values of  $x$  and  $y$ , where  $x$  is proportional to  $y$ . What are the values of  $P$  and  $Q$ ?

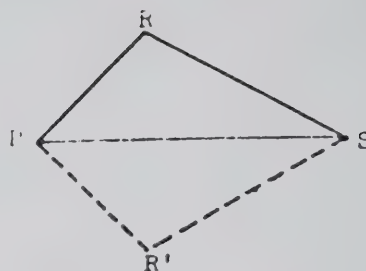
- A  $P = 14$  and  $Q = 31$
- B  $P = 10$  and  $Q = 14$
- C  $P = 10$  and  $Q = 31$
- D  $P = 14$  and  $Q = 15$
- E  $P = 15$  and  $Q = 14$

Calculator used?

Yes / No

有/沒有

25.



如果在一個對於  $\overline{PS}$  線的反射 (反轉) 的作用下,  $\triangle PRS$  被映到  $\triangle PR'S$ , 下列那一句關於長度的句子一定是真的?

- A  $\overline{PS}$  之長 =  $\overline{PR}$  之長 +  $\overline{PR'}$  之長
- B  $\overline{RS}$  之長 =  $\overline{PR'}$  之長
- C  $\overline{PR}$  之長 =  $\overline{R'S}$  之長
- D  $\overline{R'R}$  之長 =  $\overline{PS}$  之長
- E  $\overline{PR}$  之長 =  $\overline{PR'}$  之長

有用計算機嗎? 有/沒有

26.

$x$	3	6	P
$y$	7	Q	35

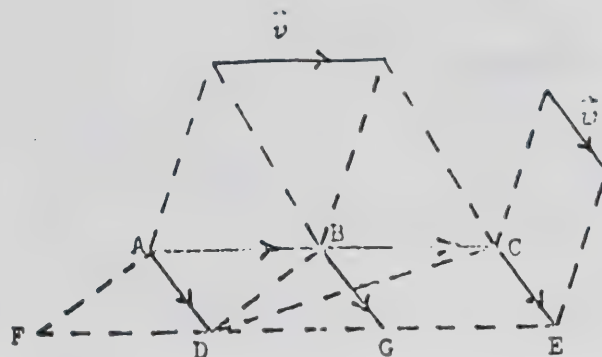
上表顯示  $x$  與  $y$  之值, 其中  $x$  跟  $y$  成正比例。問  $P$  及  $Q$  之值為何?

- A  $P = 14$  及  $Q = 31$
- B  $P = 10$  及  $Q = 14$
- C  $P = 10$  及  $Q = 31$
- D  $P = 14$  及  $Q = 15$
- E  $P = 15$  及  $Q = 14$

有用計算機嗎? 有/沒有



27.



Given  $\vec{v}$  and  $\vec{w}$  as shown in the figure above, what is  $\vec{DF}$ , the vector from D to B.

- A  $\vec{v} + \vec{w}$
- B  $\vec{v} - \vec{w}$
- C  $\vec{w} - \vec{v}$
- D  $-\vec{w} - \vec{v}$
- E  $\vec{v} + 2\vec{w}$

Calculator used?

Yes / No

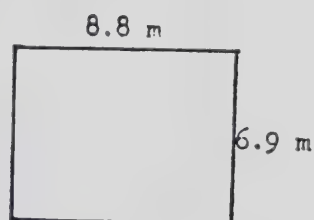
在上圖中給定  $\vec{v}$  and  $\vec{w}$ ，從 D 到 B 的矢量  $\vec{DF}$  是

- A  $\vec{v} + \vec{w}$
- B  $\vec{v} - \vec{w}$
- C  $\vec{w} - \vec{v}$
- D  $-\vec{w} - \vec{v}$
- E  $\vec{v} + 2\vec{w}$

有用計算機嗎？

有/沒有

28.



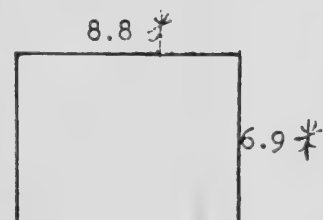
Which of the following is the closest approximation to the area of the rectangle with measurements given?

- A 48  $\text{m}^2$
- B 54  $\text{m}^2$
- C 56  $\text{m}^2$
- D 63  $\text{m}^2$
- E 72  $\text{m}^2$

Calculator used?

Yes / No

28.



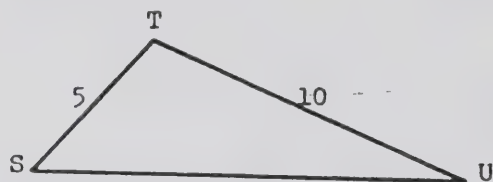
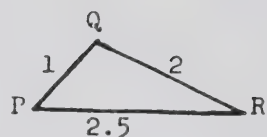
下列那一項最接近如上圖所示長方形的面積？

- A 48 平方米
- B 54 平方米
- C 56 平方米
- D 63 平方米
- E 72 平方米

有用計算機嗎？

有/沒有

29.



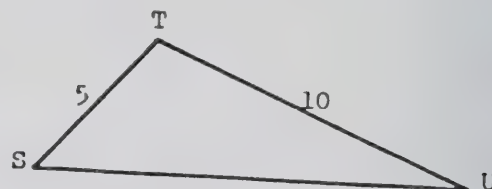
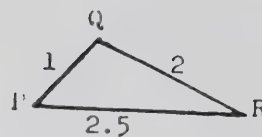
Triangles PQR and STU are similar.  
How long is  $SU$ ?

- A 5
- B 10
- C 12.5
- D 15
- E 25

Calculator used?

Yes / No

29.



三角形 PQR 與 STU 相似。  
 $SU$  長多少?

- A 5
- B 10
- C 12.5
- D 15
- E 25

有用計算機嗎?

有/沒有

30.

If  $5x + 4 = 4x - 31$ , then  
 $x$  is equal to

- A -35
- B -27
- C 3
- D 27
- E 35

Calculator used?

Yes / No

30.

若  $5x + 4 = 4x - 31$ ,  
 $x$  等於

- A -35
- B -27
- C 3
- D 27
- E 35

有用計算機嗎?

有/沒有

D

有/沒有

.9米

L 圖

有/沒有

31.

A shopkeeper has  $x$  kg of tea in stock. He sells 15 kg and then receives a new lot weighing  $2y$  kg. What weight of tea does he now have?

- A  $x - 15 - 2y$   
 B  $x + 15 + 2y$   
 C  $x - 15 + 2y$   
 D  $x + 15 - 2y$   
 E None of these

Calculator used?

Yes / No

31.

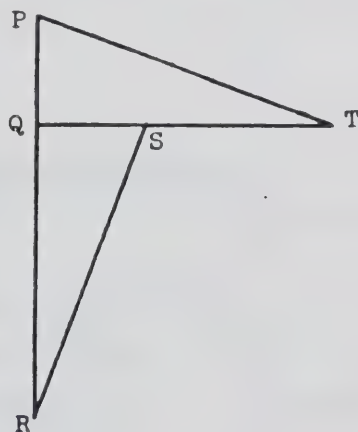
一店員有  $x$  kg 茶葉的存貨。他賣出了 15 kg，後來接到了  $2y$  kg 的新貨。他現在有茶葉多少 kg？

- A  $x - 15 - 2y$   
 B  $x + 15 + 2y$   
 C  $x - 15 + 2y$   
 D  $x + 15 - 2y$   
 E 以上都不是

有用計算機嗎？

有/沒有

32.



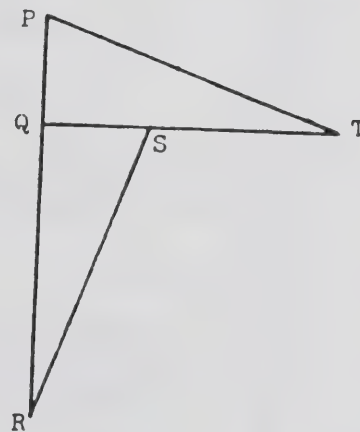
$\triangle PQT$  can be rotated (turned) onto  $\triangle SQR$ . The center of rotation is

- A point P  
 B point Q  
 C point R  
 D point S  
 E point T

Calculator used?

Yes / No

32.



$\triangle PQT$  可以被旋轉至  $\triangle SQR$ . 旋轉中心是

- A P 點  
 B Q 點  
 C R 點  
 D S 點  
 E T 點

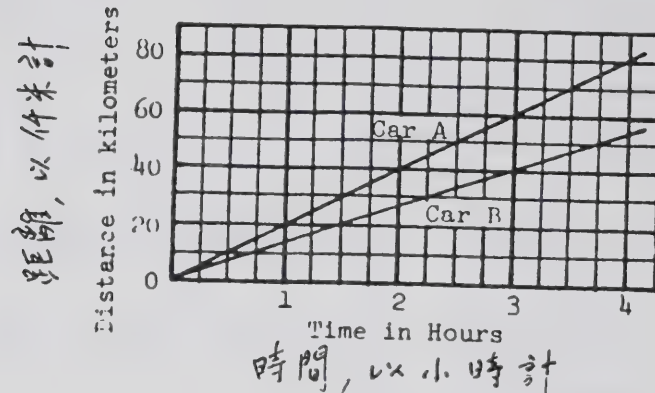
有用計算機嗎？

有/沒有



Use this graph to answer questions 33 and 34.

下圖適用於第 33 及 34 題。



33.

Three hours after starting, car A is how many kilometers ahead of car B?

- A 2
- B 10
- C 15
- D 20
- E 25

Calculator used?

Yes / No

33.

從開始三小時後, A 車距離 B 車有多少千米?

- A 2
- B 10
- C 15
- D 20
- E 25

有用計算機嗎?

有/沒有

34.

How much longer does it take for car B to go 50 kilometers than it does for car A to go 50 kilometers?

- A 1 hour 15 minutes
- B 1 hour 30 minutes
- C 2 hours
- D 2 hours 30 minutes
- E 2 hours 35 minutes

Calculator used?

Yes / No

34.

B 車行 50 千米要比 A 車行 50 千米需要長多久?

- A 1 小時 15 分鐘
- B 1 小時 30 分鐘
- C 2 小時
- D 2 小時 30 分鐘
- E 2 小時 35 分鐘

有用計算機嗎?

有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

**BOOKLET 8**

**COGNITIVE TEST**

**SIXTH FORMS**

**time: 55 mins.**

**SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81**

# INSTRUCTIONS FOR SPECIMENS

1. This is a test on different topics in mathematics. Since it is an inter-national test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? Yes No  
有使用計算機嗎? 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的, 所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後, 如果你有時間, 你可以再答你留空了的問題。
2. 在整個測驗中, 請用 '粗' 的 HB 鉛筆作答。
3. 在答案紙的上端, 請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

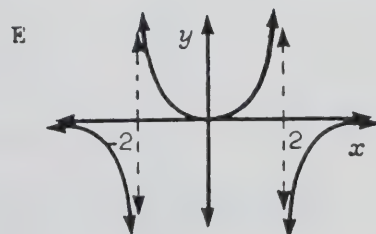
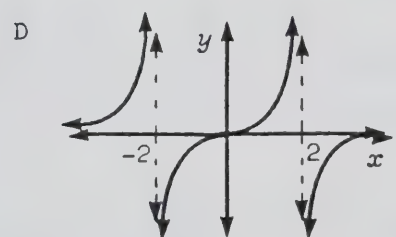
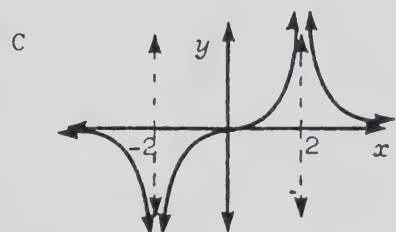
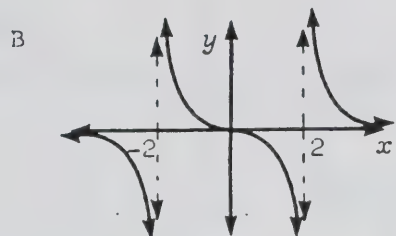
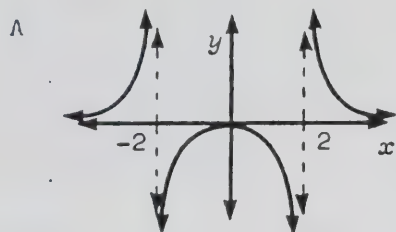
假如你用了計算機作答, 你須將答案空格如下填上:

Calculator used? Yes No  
有使用計算機嗎? 有 沒有



1. Which of these is the sketch of the graph of the function  $f$  where

$$f(x) = \frac{x}{(x-2)(x+2)} ?$$

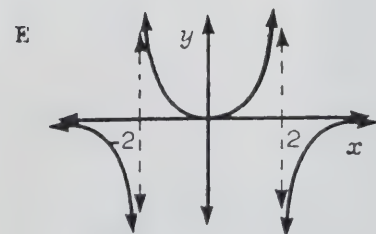
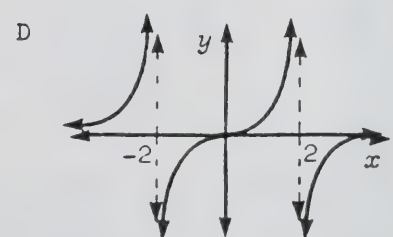
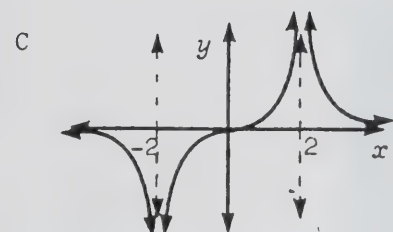
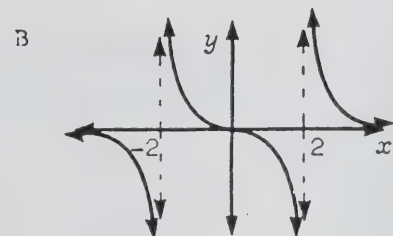
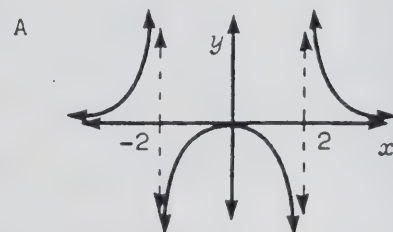


Calculator used? Yes / No

1.

$$f(x) = \frac{x}{(x-2)(x+2)}.$$

下列那一幅圖是函數  $f$  的圖像?



有用計算機嗎? 有/沒有

2. Given that  $a \geq 0$ ,  $\sqrt[6]{a^5}$  is equal to

- A  $a^{\frac{2}{3}} a^{\frac{1}{6}}$   
 B  $a^{\frac{6}{5}}$   
 C  $\sqrt[3]{a^{10}}$   
 D  $\sqrt[7]{a^6}$   
 E  $\sqrt[3]{a^5} \sqrt[3]{a^5}$

Calculator used? Yes / No

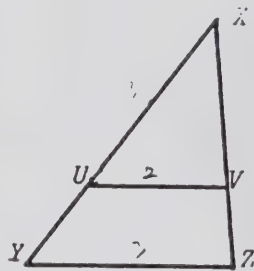
2. 已知  $a \geq 0$ ,  $\sqrt[6]{a^5}$  等於

- A  $a^{\frac{2}{3}} a^{\frac{1}{6}}$   
 B  $a^{\frac{6}{5}}$   
 C  $\sqrt[3]{a^{10}}$   
 D  $\sqrt[7]{a^6}$   
 E  $\sqrt[3]{a^5} \sqrt[3]{a^5}$

有用計算機嗎? 有/沒有

3. If  $UV = 2$ ,  $YZ = 3$ ,  $XU = 3$  and  $UV \parallel YZ$ , then  $UY$  is equal to

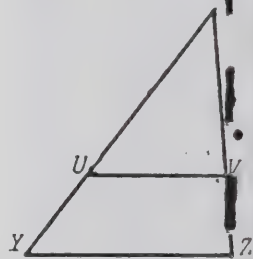
- A  $4\frac{1}{2}$   
 B 3  
 C 2  
 D  $1\frac{1}{2}$   
 E  $\frac{2}{3}$



Calculator used? Yes / No

3. 若  $UV = 2$ ,  $YZ = 3$ ,  $XU = 3$  及  $UV \parallel YZ$ , 則  $UY$  等於

- A  $4\frac{1}{2}$   
 B 3  
 C 2  
 D  $1\frac{1}{2}$   
 E  $\frac{2}{3}$



有用計算機嗎? 有/沒有

4.  $\int_1^2 (x^3 - x) dx$  is equal to

- A  $1\frac{3}{4}$   
 B 2  
 C  $2\frac{1}{4}$   
 D 3  
 E 6

Calculator used? Yes / No

4.  $\int_1^2 (x^3 - x) dx$  等於

- A  $1\frac{3}{4}$   
 B 2  
 C  $2\frac{1}{4}$   
 D 3  
 E 6

有用計算機嗎? 有/沒有

5.  $\int (x-1)^2 dx$  is equal to

- A  $2(x-1) + c$   
 B  $\frac{1}{2}(x-1)^2 + c$   
 C  $\frac{1}{3}(x-1)^3 + c$   
 D  $\frac{1}{3}(x^3 - x) + c$   
 E  $\frac{(x-1)^3}{x} + c$

Calculator used? Yes / No

5.  $\int (x-1)^2 dx$  等於

- A  $2(x-1) + c$   
 B  $\frac{1}{2}(x-1)^2 + c$   
 C  $\frac{1}{3}(x-1)^3 + c$   
 D  $\frac{1}{3}(x^3 - x) + c$   
 E  $\frac{(x-1)^3}{x} + c$

有用計算機嗎? 有/沒有

6. In how many ways can one arrange on a bookshelf 5 thick books, 4 medium sized books and 3 thin books so that the books of the same size remain together?

- A  $5! \cdot 4! \cdot 3! \cdot 3! = 103680$   
 B  $5! \cdot 4! \cdot 3! = 17280$   
 C  $(5! \cdot 4! \cdot 3!) \times 3 = 51840$   
 D  $5 \times 4 \times 3 \times 3 = 180$   
 E  $2^{12} \times 3 = 12288$

Calculator used? Yes / No

6. 書架上有厚書 5 本, 中等厚度的書 4 本, 及薄書 3 本。若同一厚度的書須放在一起, 問共有排列方法多少種?

- A  $5! \cdot 4! \cdot 3! \cdot 3! = 103680$   
 B  $5! \cdot 4! \cdot 3! = 17280$   
 C  $(5! \cdot 4! \cdot 3!) \times 3 = 51840$   
 D  $5 \times 4 \times 3 \times 3 = 180$   
 E  $2^{12} \times 3 = 12288$

有用計算機嗎? 有/沒有

7. The graph of a function  $f$  has a point of inflection at the point  $(a, 1)$ . Which of the following MUST be true?

- A  $f(a) = 0$   
 B  $f'(a) = 0$   
 C  $f''(a) = 0$   
 D  $f$  has a local maximum or minimum at  $(a, 1)$   
 E  $f'$  has a local minimum at  $(a, 1)$

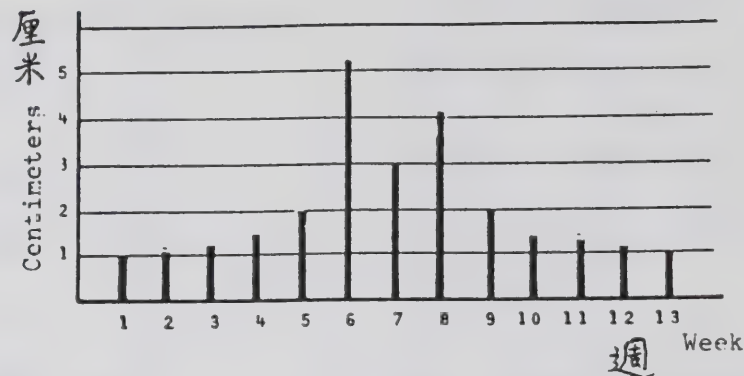
Calculator used? Yes / No

7. 在函數  $f$  的圖像中,  $(a, 1)$  是一拐點。下列那一項必真?

- A  $f(a) = 0$   
 B  $f'(a) = 0$   
 C  $f''(a) = 0$   
 D  $f$  在點  $(a, 1)$  上有一相對極大或相對極小值。  
 E  $f'$  在點  $(a, 1)$  上有一相對極小值。

有用計算機嗎? 有/沒有





8. In the graph, rainfall (in centimeters) is plotted for 13 weeks. The average weekly rainfall during the period is approximately

A 1 centimeter  
B 2 centimeters  
C 3 centimeters  
D 4 centimeters  
E 5 centimeters

Calculator used? Yes / No

8. 上圖顯示13週的雨量(以厘米計)。在該段時期內,每週的平均雨量大約是

A 1 厘米  
B 2 厘米  
C 3 厘米  
D 4 厘米  
E 5 厘米

有用計算機嗎? 有/沒有

9.  $z$  is a complex number with modulus  $\sqrt{2}$  and argument  $\frac{3\pi}{4}$ .  $z$  is equal to

A  $\frac{i-1}{\sqrt{2}}$   
B  $i-1$   
C  $\sqrt{2}(i-1)$   
D  $i+1$   
E  $\frac{i+1}{\sqrt{2}}$

Calculator used? Yes / No

9.  $z$  是一複數,它的模是  $\sqrt{2}$  幅角是  $\frac{3\pi}{4}$ 。 $z$  等於

A  $\frac{i-1}{\sqrt{2}}$   
B  $i-1$   
C  $\sqrt{2}(i-1)$   
D  $i+1$   
E  $\frac{i+1}{\sqrt{2}}$

有用計算機嗎? 有/沒有

10. If  $xy=1$  and  $x$  is greater than 0, which of the following statements is true?

- A When  $x$  is greater than 1,  $y$  is negative.  
 B When  $x$  is greater than 1,  $y$  is greater than 1.  
 C When  $x$  is less than 1,  $y$  is less than 1.  
 D As  $x$  increases,  $y$  increases.  
 E As  $x$  increases,  $y$  decreases.

Calculator used? Yes / No

10. 設  $xy=1$  及  $x$  大於 0。  
 下列那一個句子是真的？

- A 當  $x$  大於 1 時,  $y$  是一負值。  
 B 當  $x$  大於 1 時,  $y$  亦大於 1。  
 C 當  $x$  小於 1 時,  $y$  亦小於 1。  
 D 當  $x$  值增加時,  $y$  值亦增加。  
 E 當  $x$  值增加時,  $y$  值減少。

有用計算機嗎？ 有/沒有

11.

In the plane  $E$ ,  $T_v$  is the translation corresponding to the vector  $v$ ,  $S_\Omega$  is the half-turn about the center  $\Omega$ ,  $h(\Omega, k)$  the size transformation of magnitude  $k$  and center  $\Omega$ . If

$$f = h(\Omega, 3) \circ T_{\vec{i-j}} \circ T_{\vec{j+2i}} \circ h(\Omega, -\frac{1}{3}) \circ S_\Omega$$

then  $f$  is

- A a half-turn about  $\Omega$   
 B a half-turn about a point other than  $\Omega$   
 C a translation  
 D a size transformation of magnitude -1  
 E A reflection in a line through  $\Omega$

Calculator used? Yes / No

11. 在平面  $E$  上,  $T_v$  表示沿着向量  $v$  的平移變換,  $S_\Omega$  表示以  $\Omega$  為中心的半圓周旋轉,  $h(\Omega, k)$  表示以  $\Omega$  為中心, 以  $k$  為放大因子的放大變換。若

$$f = h(\Omega, 3) \circ T_{\vec{i-j}} \circ T_{\vec{j+2i}} \circ h(\Omega, -\frac{1}{3}) \circ S_\Omega$$

則  $f$  為

- A. 以  $\Omega$  為中心的半圓周旋轉。  
 B. 以某點為中心的半圓周旋轉, 而該點並非  $\Omega$ 。  
 C. 一平移變換  
 D. 一放大變換, 其放大因子為 -1。  
 E. 一個對於通過點  $\Omega$  的線之反射。

有用計算機嗎？ 有/沒有

12. If  $2x^2 - 12x + 9 = 2(x - a)^2 + b$ , then

A  $a = -3$  and  $b = -9$   
 B  $a = 3$  and  $b = -9$   
 C  $a = -3$  and  $b = 9$   
 D  $a = -3$  and  $b = 27$   
 E  $a = 3$  and  $b = 27$

Calculator used? Yes / No

12. 若  $2x^2 - 12x + 9 = 2(x - a)^2 + b$ , 則

A  $a = -3$  及  $b = -9$   
 B  $a = 3$  及  $b = -9$   
 C  $a = -3$  及  $b = 9$   
 D  $a = -3$  及  $b = 27$   
 E  $a = 3$  及  $b = 27$

有用計算機嗎? 有/沒有

13. Given that  $\sqrt{600}$  is approximately 24.4949, an approximation to 2 SIGNIFICANT DIGITS for  $\sqrt{600}$  is

A 24  
 B 24.49  
 C 24.5  
 D 24.50  
 E 25

Calculator used? Yes / No

13. 已知  $\sqrt{600}$  大約等於 24.4949, 若以兩個有效數字表  $\sqrt{600}$  寫作

A 24  
 B 24.49  
 C 24.5  
 D 24.50  
 E 25

有用計算機嗎? 有/沒有

14. Which of the following points lies in the region bounded by the lines  $y = 1$ ,  $y = x$ , and  $x + y = 6$ .

A (3, 2)  
 B (4, 3)  
 C (1, 5)  
 D (3, 4)  
 E (2, 3)

Calculator used? Yes / No

14. 下列那一點是在直線  $y = 1$ ,  $y = x$ , 及  $x + y = 6$  所包的範圍內?

A (3, 2)  
 B (4, 3)  
 C (1, 5)  
 D (3, 4)  
 E (2, 3)

有用計算機嗎? 有/沒有



15. A real valued function  $f$  defined on a set of real numbers is said to be additive if, for all  $x$  and  $y$  in the domain of  $f$ ,

$$f(x + y) = f(x) + f(y).$$

If the function  $f$  defined on the set of positive real numbers by  $f(x)$  is equal to

- A  $x^2$ , then  $f$  is additive
- B  $\sin x$ , then  $f$  is additive
- C  $\log_{10} x$ , then  $f$  is additive
- D  $2^x$ , then  $f$  is additive
- E None of the above is additive

Calculator used? Yes / No

15. 一實值函數  $f$  可稱為有加性, 如果對於該函數定義域內之任意兩實數  $x$  及  $y$ ,

$$f(x + y) = f(x) + f(y).$$

下列各函數中, 那一個有加性?

- A  $f(x) = x^2$
- B  $f(x) = \sin x$
- C  $f(x) = \log_{10} x$
- D  $f(x) = 2^x$
- E 以上各函數皆無加性。

有用計算機嗎? 有/沒有

16.  $\vec{r}$  is a vector which can be expressed as  $\cos \theta \vec{i} + \sin \theta \vec{j}$ , where  $\vec{i}$  and  $\vec{j}$  are unit vectors parallel to the  $x$  and  $y$ -axes respectively

$$\frac{d\vec{r}}{d\theta} \text{ is}$$

- A a vector perpendicular to  $\vec{r}$
- B a vector making an angle  $\theta$  with  $\vec{r}$
- C a vector parallel to  $\vec{r}$
- D a scalar equal to the distance  $\vec{r}$  from the origin.
- E a scalar equal to the maximum value of the length of  $\vec{r}$

Calculator used? Yes / No

16.  $\vec{r}$  是一向量, 它可表為

$$\cos \theta \vec{i} + \sin \theta \vec{j}$$

其中  $\vec{i}$  及  $\vec{j}$  依次是與  $x$  軸及  $y$  軸平行的單位向量。

$$\frac{d\vec{r}}{d\theta} \text{ 是}$$

- A 一與  $\vec{r}$  垂直的向量
- B 一向量, 其與  $\vec{r}$  之夾角為  $\theta$
- C 一與  $\vec{r}$  平行的向量
- D 一純量, 其值等於  $\vec{r}$  與原點的距離
- E 一純量, 其值等於  $\vec{r}$  的長度的最大值

有用計算機嗎? 有/沒有

17. Which of the following pairs of angles can be used as a COUNTER-EXAMPLE to show that

$$\sin (A + B) = \sin A + \sin B$$

is not always true?

- A  $A = 30^\circ, B = -30^\circ$
- B  $A = 180^\circ, B = 180^\circ$
- C  $A = 90^\circ, B = 360^\circ$
- D  $A = 90^\circ, B = 270^\circ$
- E  $A = 90^\circ, B = 90^\circ$

Calculator used? Yes / No

17. 用下列那一雙角可作一反例証明

$$\sin (A + B) = \sin A + \sin B$$

非恆真?

- A  $A = 30^\circ, B = -30^\circ$
- B  $A = 180^\circ, B = 180^\circ$
- C  $A = 90^\circ, B = 360^\circ$
- D  $A = 90^\circ, B = 270^\circ$
- E  $A = 90^\circ, B = 90^\circ$

有用計算機嗎? 有/沒有

- END -

- 完 -



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

**BOOKLET 9**

**COGNITIVE TEST**

**SIXTH FORMS**

**time: 55 mins.**

**SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81**



# INSTRUCTIONS FOR EXAMINEES

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? Yes No  
 有使用計算機嗎? 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used? Yes No  
 有使用計算機嗎? 有 沒有

1.

For all rational numbers  $a, b, c$   
and  $d$ ,

$$a - (b + (c - d))$$

is equal to

A  $a - b + c - d$

B  $a - b - c + d$

C  $a - b - c - d$

D  $a - b + c + d$

E None of these

Calculator used? Yes / No

1.

對於任何有理數

$a, b, c$  及  $d$ ,

$$a - (b + (c - d))$$

等於

A  $a - b + c - d$

B  $a - b - c + d$

C  $a - b - c - d$

D  $a - b + c + d$

E 上列各項皆不適合

有用計算機嗎? 有/沒有

2. The curve defined by

$$y = 3x(x - 2)(2x + 1)$$

intersects the  $x$ -axis only at  
the points

A  $(-2, 0)$  and  $(\frac{1}{2}, 0)$

B  $(2, 0)$  and  $(-\frac{1}{2}, 0)$

C  $(3, 0)$  and  $(-2, 0)$  and  $(\frac{1}{2}, 0)$

D  $(3, 0)$  and  $(2, 0)$  and  $(-\frac{1}{2}, 0)$

E  $(0, 0)$  and  $(2, 0)$  and  $(-\frac{1}{2}, 0)$

Calculator used? Yes / No

2.

以方程  $y = 3x(x - 2)(2x + 1)$   
為定義之曲線與  $x$  軸的  
交點只有

A  $(-2, 0)$  及  $(\frac{1}{2}, 0)$

B  $(2, 0)$  及  $(-\frac{1}{2}, 0)$

C  $(3, 0)$  ,  $(-2, 0)$  , 及  $(\frac{1}{2}, 0)$

D  $(3, 0)$  ,  $(2, 0)$  , 及  $(-\frac{1}{2}, 0)$

E  $(0, 0)$  ,  $(2, 0)$  , 及  $(-\frac{1}{2}, 0)$

有用計算機嗎? 有/沒有

3.

Let  $E$  be the Euclidean plane and  $f$  be the mapping from  $E$  to  $E$  which assigns to the point  $M(x, y)$ , the point  $M'(x', y')$  such that

$$\begin{aligned} x' &= y + 1 \\ y' &= -x + 1 \end{aligned}$$

Which of the following is true?

- A  $f$  is a translation with respect to the vector  $\vec{i} + \vec{j}$ , where  $\vec{i}$  and  $\vec{j}$  are the unit coordinate vectors
- B  $f$  is an orientation reversing isometry
- C  $f$  is a reflection in a line
- D  $f$  is a rotation through an angle of  $\frac{\pi}{2}$
- E  $f$  is a rotation through an angle of  $-\frac{\pi}{2}$

Calculator used? Yes / No

3.  $E$  是一平面,  $f$  是一個  
至  $E$  的映射。在這映射  
點  $M(x, y)$  的像是  $M'(x', y')$   
其中

$$\begin{aligned} x' &= y + 1 \\ y' &= -x + 1 \end{aligned}$$

下列那一項是正確的?

- A  $f$  是一個沿着向量  $\vec{i} + \vec{j}$   
的平移變換, 其中  $\vec{i}$  及  $\vec{j}$   
為單位坐標向量
- B  $f$  是一個反方向的等  
變換
- C  $f$  是一個反射變換
- D  $f$  是一個  $\frac{\pi}{2}$  弧度的旋
- E  $f$  是一個  $-\frac{\pi}{2}$  弧度的

有用計算機嗎? 有/沒有

4.

The derivative with respect to

$x$  of  $\frac{4}{\sqrt{3x-4}}$  is

- A  $12\sqrt{3x-4}$
- B  $\frac{4}{\sqrt{3}}$
- C  $\frac{-2}{(3x-4)^{\frac{3}{2}}}$
- D  $\frac{-6}{(3x-4)^{\frac{3}{2}}}$
- E  $6\sqrt{3x-4}$

Calculator used? Yes / No

4.

$\frac{4}{\sqrt{3x-4}}$  對於  $x$  的導數

- A  $12\sqrt{3x-4}$
- B  $\frac{4}{\sqrt{3}}$
- C  $\frac{-2}{(3x-4)^{\frac{3}{2}}}$
- D  $\frac{-6}{(3x-4)^{\frac{3}{2}}}$
- E  $6\sqrt{3x-4}$

有用計算機嗎? 有/沒有



一個由E  
這映射下,  
是  $M'(x', y')$ ,

正確的?

向量  $i+j$

其中  $i$  及  $j$

同量

同的等度量

變換

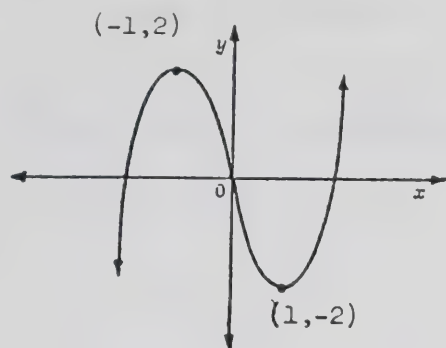
度的旋轉

度的旋轉

有/沒有

5.

The diagram shows the sketch of the graph of the cubic function  $f$ .



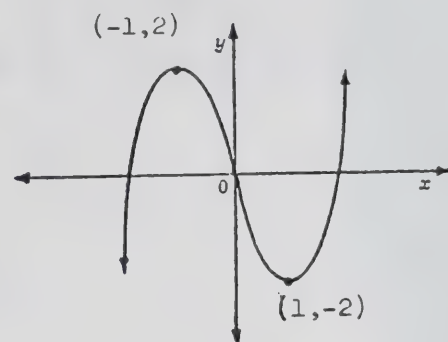
The function  $f$  could only be given by  $f(x)$  is equal to

- A  $-x^3 - x$
- B  $x^3 - 3x^2$
- C  $x^3 - 3x$
- D  $3x^3 - x$
- E  $x^3 + 3x^2$

Calculator used? Yes / No

4

5. 圖中繪有三次函數  $f$  的圖像。



函數  $f$  可寫為  $f(x)$  等於

- A  $-x^3 - x$
- B  $x^3 - 3x^2$
- C  $x^3 - 3x$
- D  $3x^3 - x$
- E  $x^3 + 3x^2$

有用計算機嗎? 有/沒有

6.

What is the sum of the infinite geometric series

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots ?$$

- A  $\frac{5}{8}$
- B  $\frac{2}{3}$
- C  $\frac{3}{5}$
- D  $\frac{3}{2}$
- E  $\infty$

Calculator used? Yes / No

6.

無窮幾何級數

$$1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \dots$$

的總和是

- A  $\frac{5}{8}$
- B  $\frac{2}{3}$
- C  $\frac{3}{5}$
- D  $\frac{3}{2}$
- E  $\infty$

有用計算機嗎? 有/沒有

有/沒有

7.

$$\int_0^1 \frac{12x}{(2x^2 + 1)^2} dx \text{ is equal to}$$

A -2

B -1

C 2

D  $\ln 2$ E  $3 \ln 3$ 

Calculator used? Yes / No

7.

$$\int_0^1 \frac{12x}{(2x^2 + 1)^2} dx \text{ 等於}$$

A -2

B -1

C 2

D  $\ln 2$ E  $3 \ln 3$ 

有用計算機嗎? 有/速

8.

Two mathematical models are proposed to predict the return  $y$ , in dollars, from the sale of  $x$  thousand units of an article (where  $0 < x < 5$ ). Each of these models, A and B, is based on different marketing methods.

$$\text{model A } y = 6x - x^2$$

$$\text{model B } y = 2x$$

For what values of  $x$  does model B predict a greater return than model A?

A  $0 < x < 4$ B  $0 < x < 5$ C  $3 < x < 5$ D  $3 < x < 4$ E  $4 < x < 5$ 

Calculator used? Yes / No

8.

有兩個數學模型,分別用月測當銷售  $x$  千 (其中  $0 < x < 5$ ) 貨物時所得的營業額。此兩種模型 A 及 B 是基於同的市場方法的。

$$\text{模型 A } y = 6x - x^2$$

$$\text{模型 B } y = 2x$$

問模型 B 在下列那一區間比模型 A 作一較大的預測

A  $0 < x < 4$ B  $0 < x < 5$ C  $3 < x < 5$ D  $3 < x < 4$ E  $4 < x < 5$ 

有用計算機嗎? 有/計

9.

One side of an equilateral triangle lies along the  $x$ -axis. The sum of the slopes of the three sides is

- A 0
- B -1
- C 1
- D  $2\sqrt{3}$
- E  $1 + 2\sqrt{3}$

Calculator used? Yes / No

9.

一等邊三角形之一邊與  $x$  軸重疊。它各邊斜率的和是

- A 0
- B -1
- C 1
- D  $2\sqrt{3}$
- E  $1 + 2\sqrt{3}$

有用計算機嗎? 有/沒有

10.

The area enclosed between the curve  $y = x^4 - x^2$  and the  $x$ -axis is equal to

- A 0
- B  $\frac{2}{15}$
- C  $\frac{4}{15}$
- D  $\frac{1}{3}$
- E  $\frac{2}{3}$

Calculator used? Yes / No

10.

曲线  $y = x^4 - x^2$  與  $x$  軸所包的面積等於

- A 0
- B  $\frac{2}{15}$
- C  $\frac{4}{15}$
- D  $\frac{1}{3}$
- E  $\frac{2}{3}$

有用計算機嗎? 有/沒有



11.

If  $X$  and  $Y$  are sets, then  
 $(X \cup Y) \cap (X \cap Y)$  is equal  
 to

- A  $X$
- B  $Y$
- C  $X \cup Y$
- D  $X \cap Y$
- E  $(X \cup Y) \cup (X \cap Y)$

Calculator used? Yes / No

11.

若  $X$  及  $Y$  皆為集，則  
 $(X \cup Y) \cap (X \cap Y)$  等於

- A  $X$
- B  $Y$
- C  $X \cup Y$
- D  $X \cap Y$
- E  $(X \cup Y) \cup (X \cap Y)$

有用計算機嗎？ 有 / 沒有

12.

Four persons whose names begin  
 with different letters are placed  
 in a row, side by side. What is  
 the probability that they will be  
 placed in alphabetical order from  
 left to right?

- A  $\frac{1}{120}$
- B  $\frac{1}{24}$
- C  $\frac{1}{12}$
- D  $\frac{1}{6}$
- E  $\frac{1}{4}$

Calculator used? Yes / No

12.

四人平排而坐，此四人的英文  
 名的第一個字母皆不相同。  
 問按照彼等名字之首字母的  
 次序從左至右而坐的相  
 率是多少？

- A  $\frac{1}{120}$
- B  $\frac{1}{24}$
- C  $\frac{1}{12}$
- D  $\frac{1}{6}$
- E  $\frac{1}{4}$

有用計算機嗎？ 有 / 沒有

13.

$5^{2n} + 5^n$ , where  $n$  is a natural number,  
is divisible by 13

- A when  $n = 2$  only
- B when  $n$  is a non-negative even number
- C when  $n$  is of the form  $8p + 2$ , where  $p$  is a natural number
- D when  $n$  is of the form  $4p + 2$ , where  $p$  is a natural number
- E for no value of  $n$

Calculator used? Yes / No

13.

下列那一項列出了所有自然數  $n$ , 其能使  $5^{2n} + 5^n$  被 13 整除?

- A 祇有 2
  - B 所有非負值的偶數
  - C 所有形如  $8p + 2$  的數, 其中  $p$  為自然數
  - D 所有形如  $4p + 2$  的數, 其中  $p$  為自然數
  - E 沒有自然數適合
- 有用計算機嗎? 有/沒有

14.

The solution set for the equation  
 $(1 - 2x)(2 + x) = 0$  is

- A  $\{\frac{1}{2}, -2\}$
- B  $\{-\frac{1}{2}, 2\}$
- C  $\{-1, -2\}$
- D  $\{\frac{1}{2}, 2\}$
- E  $\{2, -2\}$

Calculator used? Yes / No

14. 方程  $(1 - 2x)(2 + x) = 0$  的解集是

- A  $\{\frac{1}{2}, -2\}$
- B  $\{-\frac{1}{2}, 2\}$
- C  $\{-1, -2\}$
- D  $\{\frac{1}{2}, 2\}$
- E  $\{2, -2\}$

有用計算機嗎? 有/沒有

15.

At which point does the curve  
 $y = 3x^2 - x^3$  have a local minimum?

- A (2,4)
- B (3,0)
- C (1,2)
- D (0,3)
- E (0,0)

Calculator used? Yes / No

15.

曲綫  $y = 3x^2 - x^3$  在下列  
 點有一相對極小值？

- A (2,4)
- B (3,0)
- C (1,2)
- D (0,3)
- E (0,0)

有用計算機嗎？ 有/沒有

16.

An operation  $*$  (on the set of  
 real numbers) is commutative if,  
 for every two real numbers  $x$  and  $y$ ,  
 $x * y = y * x$ . Which of the  
 operations defined below is  
 commutative?

- A  $x * y = x + xy$
- B  $x * y = x - y$
- C  $x * y = x(x + y)$
- D  $x * y = xy(x + y)$
- E  $x * y = x^2 + xy^2 + y^4$

Calculator used? Yes / No

16.

在實數集上的運算  $*$   
 可換的,如果對於任意  
 數  $x$  及  $y$ ,  $x * y = y * x$ 。  
 下列那一項運算是可換  
 的？

- A  $x * y = x + xy$
- B  $x * y = x - y$
- C  $x * y = x(x + y)$
- D  $x * y = xy(x + y)$
- E  $x * y = x^2 + xy^2 + y^4$

有用計算機嗎？ 有/沒有



下列那  
值？

17.

If  $x > 0$ ,  $y > 0$ , and  $x \neq y$ ,  
then  $\frac{1}{\sqrt{x} - \sqrt{y}}$  is equal to

A  $\frac{\sqrt{x} + \sqrt{y}}{x - y}$

B  $\frac{\sqrt{x} - \sqrt{y}}{x - y}$

C  $\frac{1}{\sqrt{x} - y}$

D  $\frac{1}{\sqrt{x}} - \frac{1}{\sqrt{y}}$

E  $\frac{\sqrt{x} + \sqrt{y}}{x^2 - y^2}$

有/沒有

簡 \* 是  
任意實

=  $y * x$ .

是可換

Calculator used? Yes / No

17.

如果  $x > 0$ ,  $y > 0$ , 及  $x \neq y$ ,  
則  $\frac{1}{\sqrt{x} - \sqrt{y}}$  等於

A  $\frac{\sqrt{x} + \sqrt{y}}{x - y}$

B  $\frac{\sqrt{x} - \sqrt{y}}{x - y}$

C  $\frac{1}{\sqrt{x} - y}$

D  $\frac{1}{\sqrt{x}} - \frac{1}{\sqrt{y}}$

E  $\frac{\sqrt{x} + \sqrt{y}}{x^2 - y^2}$

有用計算機嗎？ 有/沒有

- END -

- 完 -

B2

+  $y^4$

有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 10

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? Yes No  
有使用計算機嗎? 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同類型的問題。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18

以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used? Yes No  
有使用計算機嗎? 有 沒有



1. For the equation  $x^2 - 5x + 6 = 0$

- A there is no solution
- B there is exactly *one* solution
- C there are exactly *two* solutions
- D there are exactly *three* solutions
- E there are *more than three* solutions

Calculator used? Yes / No

1. 方程式  $x^2 - 5x + 6 = 0$

- A 無解
- B 有唯一解
- C 祇有兩解
- D 祇有三解
- E 有多於三解

有用計算機嗎? 有/沒有

2. If  $u = 3 + i$ , and  $v = -2 - 2i$ ,  
then  $\frac{u}{v}$  is equal to

- A  $-1 + 4i$
- B  $-1 + \frac{1}{2}i$
- C  $-1 - \frac{1}{2}i$
- D  $-2 + i$
- E  $-2 - i$

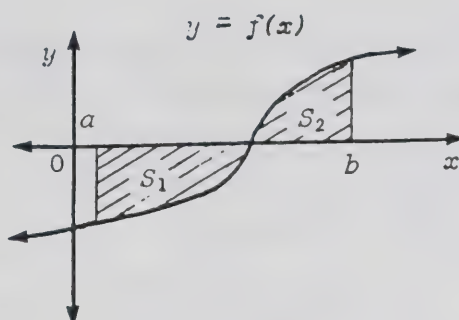
Calculator used? Yes / No

2. 若  $u = 3 + i$  及  $v = -2 - 2i$ ,  
則  $\frac{u}{v}$  等於

- A  $-1 + 4i$
- B  $-1 + \frac{1}{2}i$
- C  $-1 - \frac{1}{2}i$
- D  $-2 + i$
- E  $-2 - i$

有用計算機嗎? 有/沒有

3.



This graph shows the graph of  $y = f(x)$ .

$S_1$  is the area enclosed by the  $x$ -axis,  $x = a$  and  $y = f(x)$ .

$S_2$  is the area enclosed by the  $x$ -axis,  $x = b$  and  $y = f(x)$ .

where  $a < b$  and  $0 < S_2 < S_1$

The value of  $\int_a^b f(x) dx$  is

- A  $S_1 + S_2$
- B  $S_1 - S_2$
- C  $S_2 - S_1$
- D  $|S_1 - S_2|$
- E  $\frac{1}{2}(S_1 + S_2)$

Calculator used? Yes / No

上圖為  $y = f(x)$  的圖線。

$S_1$  為  $x$  軸,  $x = a$  及  $y = f(x)$  所包的面積。

$S_2$  為  $x$  軸,  $x = b$  及  $y = f(x)$  所包的面積, 其中  $a < b$  及  $0 < S_2 < S_1$ 。

$\int_a^b f(x) dx$  的值是

- A  $S_1 + S_2$
- B  $S_1 - S_2$
- C  $S_2 - S_1$
- D  $|S_1 - S_2|$
- E  $\frac{1}{2}(S_1 + S_2)$

有用計算機嗎? 有/沒有

4.

If the graph of the equation  $y = 3x^3 + 6x^2 + kx + 9$  has a point of inflection and a horizontal tangent for the same value of  $x$ , then  $k$  is equal to

- A 0
- B 1
- C 2
- D 3
- E 4

Calculator used? Yes / No

4. 若對於同一  $x$  值, 函數  $y = 3x^3 + 6x^2 + kx + 9$  之圖線有一拐點及有一與  $x$  軸平行之切線, 則  $k$  之值等於

- A 0
- B 1
- C 2
- D 3
- E 4

有用計算機嗎? 有/沒有

5.

The mean of a population is 5 and its standard deviation is 1. If 10 is added to each element of the population, the new mean and standard deviation are

- A mean = 15, standard deviation = 1
- B mean = 15, standard deviation = 5
- C mean = 15, standard deviation = 11
- D mean = 10, standard deviation = 1
- E mean = 10, standard deviation = 5

Calculator used? Yes / No

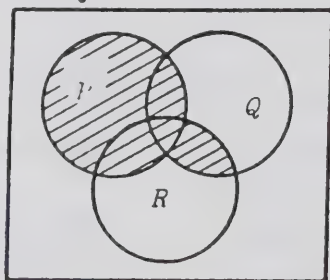
5. 總體的平均是 5, 標準差是 1. 如果總體的每一元素皆加 10, 問新的平均及新的標準差多少?

- A 平均 = 15, 標準差 = 1
- B 平均 = 15, 標準差 = 5
- C 平均 = 15, 標準差 = 11
- D 平均 = 10, 標準差 = 1
- E 平均 = 10, 標準差 = 5

有用計算機嗎? 有/沒有

6.

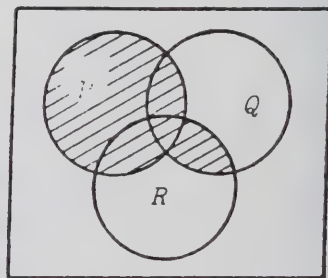
The symbol  $P \cap Q$  represents the intersection of sets  $P$  and  $Q$  and the symbol  $P \cup Q$  represents the union of sets  $P$  and  $Q$ . Which of the following represents the shaded portion of the diagram below?



- A  $(P \cap Q) \cup R$
- B  $P \cup (Q \cap R)$
- C  $P \cap (Q \cup R)$
- D  $(P \cap Q) \cap R$
- E  $(P \cup Q) \cap R$

Calculator used? Yes / No

6. 符號  $P \cap Q$  表示集  $P$  與集  $Q$  的交集, 而符號  $P \cup Q$  表示集  $P$  與集  $Q$  的併集. 下列那一項表示圖中的陰影部份?



- A  $(P \cap Q) \cup R$
- B  $P \cup (Q \cap R)$
- C  $P \cap (Q \cup R)$
- D  $(P \cap Q) \cap R$
- E  $(P \cup Q) \cap R$

有用計算機嗎? 有/沒有

圓綫.  
=  $f(x)$  所包  
=  $f(x)$  所包  
-  $0 < S_2 < S_1$

有/沒有

, 函數  
之圖綫  
與  $x$  軸平行  
值等於

有/沒有



7.

If  $a_1 = 1$  and  $a_{n+1} = a_n + 2n + 1$ ,  
then for all  $n$

- A  $a_n = 4$   
 B  $a_n = 4n + 2$   
 C  $a_n = 2n - 1$   
 D  $a_n = 2n + 2$   
 E  $a_n = n^2$

Calculator used? Yes / No

7.

若  $a_1 = 1$  及  $a_{n+1} = a_n + 2n$   
則對於所有  $n$

- A  $a_n = 4$   
 B  $a_n = 4n + 2$   
 C  $a_n = 2n - 1$   
 D  $a_n = 2n + 2$   
 E  $a_n = n^2$

有用計算機嗎? 有/沒

8.

$\frac{8}{3 - \sqrt{2}}$  is equal to

- A  $\frac{8(3 + \sqrt{2})}{5}$   
 B  $\frac{8(3 + \sqrt{2})}{7}$   
 C  $\frac{8(3 + \sqrt{2})}{11}$   
 D  $\frac{8(3 + \sqrt{2})}{13}$   
 E  $\frac{8(3 - \sqrt{2})}{13}$

Calculator used? Yes / No

8.

$\frac{8}{3 - \sqrt{2}}$  等於

- A  $\frac{8(3 + \sqrt{2})}{5}$   
 B  $\frac{8(3 + \sqrt{2})}{7}$   
 C  $\frac{8(3 + \sqrt{2})}{11}$   
 D  $\frac{8(3 + \sqrt{2})}{13}$   
 E  $\frac{8(3 - \sqrt{2})}{13}$

有用計算機嗎? 有/沒

9. Which complex transformation is associated with the similarity transformation  $s$  such that

$$B = s(A) \text{ and } C = s(B)$$

with  $A(0,1)$ ,  $B(-1,0)$ ,  $C(0,-3)$

- A  $z' = (1+2i)z + 1 - i$   
 B  $z' = (1-2i)z + 1 + i$   
 C  $z' = (1-i)z + 1 + 2i$   
 D  $z' = (1+2i)z$   
 E none of the above

Calculator used? Yes / No

9. 給出  $A(0,1)$ ,  $B(-1,0)$ ,  $C(0,-3)$ .  
相似變換  $s$  使

$$B = s(A) \text{ and } C = s(B).$$

下列那一項複變換與  $s$  的性質配合?

- A  $z' = (1+2i)z + 1 - i$   
 B  $z' = (1-2i)z + 1 + i$   
 C  $z' = (1-i)z + 1 + 2i$   
 D  $z' = (1+2i)z$

E 以上四項皆不是  
有用計算機嗎? 有/沒

10.

$$= a_n + 2n + 1,$$

$P$  is a polynomial in  $x$  of degree  $m$ , and  $Q$  is a polynomial in  $x$  of degree  $n$ , with  $n < m$ . The degree of polynomial  $(P + Q)(P - Q)$  is

- A  $2m$
- B  $m^2$
- C  $mn$
- D  $n^2$
- E  $m^2 - n^2$

有/沒有

Calculator used? Yes / No

10.

$P$  與  $Q$  都是以  $x$  為變數的多項式。 $P$  是  $m$  次,  $Q$  是  $n$  次, 其中  $n < m$ 。多項式  $(P + Q)(P - Q)$  的次數是

- A  $2m$
- B  $m^2$
- C  $mn$
- D  $n^2$
- E  $m^2 - n^2$

有用計算機嗎? 有/沒有

11.

If  $z = \frac{\sqrt{3} + i}{2}$ , then  $z^{60}$  is equal to

- A  $i$
- B  $-i$
- C  $0$
- D  $-1$
- E  $1$

Calculator used? Yes / No

有/沒有

,  $C(0, -3)$  有

$$= s(B).$$

換與  $s$  上

$$+ 1 - i$$

$$+ 1 + i$$

$$- 1 + 2i$$

皆不是

? 有/沒有

12.

$x$  and  $y$  are real numbers. The product of the matrices

$$A = \begin{pmatrix} 1 & x \\ 0 & 1 \end{pmatrix} \text{ and } B = \begin{pmatrix} 1 & 0 \\ y & 1 \end{pmatrix}$$

is commutative only if

- A  $x = 0$
- B  $y = 0$
- C  $x = y$
- D  $x = 0$  or  $y = 0$
- E  $x = 0$  and  $y = 0$

Calculator used? Yes / No

11.

若  $z = \frac{\sqrt{3} + i}{2}$ , 則  $z^{60}$  等於

- A  $i$
- B  $-i$
- C  $0$
- D  $-1$
- E  $1$

有用計算機嗎? 有/沒有

12.

$x$  及  $y$  為實數。  
若矩陣

$$A = \begin{pmatrix} 1 & x \\ 0 & 1 \end{pmatrix} \text{ 與 } B = \begin{pmatrix} 1 & 0 \\ y & 1 \end{pmatrix}$$

之積可換, 則

- A  $x = 0$
- B  $y = 0$
- C  $x = y$
- D  $x = 0$  或  $y = 0$
- E  $x = 0$  及  $y = 0$

有用計算機嗎? 有/沒有

13.

A radio-active element decomposes according to formula

$$y = y_0 e^{-kt}$$

where  $y$  is the mass of the element remaining after  $t$  days and  $y_0$  is the value of  $y$  for  $t = 0$ . Find the value of the constant  $k$  for an element whose half-life (i.e. time to decompose half of the material) is 4 days.

A  $\frac{1}{4} \log_e 2$

B  $\log_e \frac{1}{2}$

C  $\log_2 e$

D  $(\log_e 2)^{\frac{1}{4}}$

E  $2e^4$

Calculator used? Yes / No

13.

某放射性元素之分解乃根據

$$y = y_0 e^{-kt}$$

其中  $y$  是該元素分解了  $t$  日後剩餘的質量，而  $y_0$  是  $y$  在  $t=0$  時之值。某元素的半生期（該元素分解一半所需的時間）4 天。試求常數  $k$  之值。

A  $\frac{1}{4} \log_e 2$

B  $\log_e \frac{1}{2}$

C  $\log_2 e$

D  $(\log_e 2)^{\frac{1}{4}}$

E  $2e^4$

有用計算機嗎？有/沒有

14.

The inverse of the function  $\{(-2,0), (-1,1), (0,2), (1,3)\}$  is

A  $\{(2,0), (1,-1), (0,-2), (-1,-3)\}$

B  $\{(0,-2), (1,-1), (2,0), (3,1)\}$

C  $\{(\frac{1}{2},0), (-1,1), (0,\frac{1}{2}), (1,\frac{1}{3})\}$

D  $\{(1,3), (0,2), (-1,1), (-2,0)\}$

E  $\{(0,2), (1,1), (2,0), (-3,-1)\}$

Calculator used? Yes / No

14.

函數  $\{(-2,0), (-1,1), (0,2), (1,3)\}$  的逆函數是

A  $\{(2,0), (1,-1), (0,-2), (-1,-3)\}$

B  $\{(0,-2), (1,-1), (2,0), (3,1)\}$

C  $\{(\frac{1}{2},0), (-1,1), (0,\frac{1}{2}), (1,\frac{1}{3})\}$

D  $\{(1,3), (0,2), (-1,1), (-2,0)\}$

E  $\{(0,2), (1,1), (2,0), (-3,-1)\}$

有用計算機嗎？有/沒有



15.

The function  $f$  is defined by  
 $f(x) = e^{x^2}$ . Then  $f'(x)$  is equal  
 to

- A  $e^{x^2}$   
 B  $e^{2x}$   
 C  $2xe^{x^2}$   
 D  $e^{x^2} + 2x$   
 E  $2e^{2x^3}$

Calculator used? Yes / No

15.

函數  $f$  的定義是  $f(x) = e^{x^2}$ .  
 那麼  $f'(x)$  等於

- A  $e^{x^2}$   
 B  $e^{2x}$   
 C  $2xe^{x^2}$   
 D  $e^{x^2} + 2x$   
 E  $2e^{2x^3}$

有用計算機嗎? 有/沒有

16.



The intersection of a cylinder with  
 plane through its axis is a rectangle  
 of perimeter 6 m. The radius of the  
 cylinder satisfying this condition  
 and having maximum volume is

- A 2.5 m  
 B 2 m  
 C 1.5 m  
 D 1 m  
 E 0.5 m

Calculator used? Yes / No

一圓筒形與一過其軸之平面相  
 交成一周界為 6 m 之矩形。在上述  
 條件下圓筒形的半徑應是多長才  
 可使它的體積為最大?

- A 2.5 m  
 B 2 m  
 C 1.5 m  
 D 1 m  
 E 0.5 m

有用計算機嗎? 有/沒有

17. In a Cartesian coordinate system,  
 what is the equation of the  
 straight line passing through the  
 point  $(0, -5)$  and parallel to the  
 straight line whose equation is  
 $y = 2x + 3$ ?

- A  $x + 2y + 5 = 0$   
 B  $2x - y - 5 = 0$   
 C  $2x + 3 = -5$   
 D  $2x - 5y + 3 = 0$   
 E  $2x + y + 5 = 0$

Calculator used? Yes / No

17. 在笛卡兒坐標系中, 通過點  $(0, -5)$   
 且與直線  $y = 2x + 3$  平行之直  
 線之方程是

- A  $x + 2y + 5 = 0$   
 B  $2x - y - 5 = 0$   
 C  $2x + 3 = -5$   
 D  $2x - 5y + 3 = 0$   
 E  $2x + y + 5 = 0$

有用計算機嗎? 有/沒有

乃根據公式

解了  $t$  日後所  
 是  $y$  在  $t=0$   
 半生期(即  
 需的時間)是  
 $k$  之值。

有/沒有

$(0, 2), (1, 3)$

$(0, -2),$

$(2, 0),$

$(0, \frac{1}{2}),$

$(-1, 1),$

$(2, 0),$

? 有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 11

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? ☒ Yes ☐ No  
有使用計算機 有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
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3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used? ☒ Yes ☐ No  
有使用計算機 有 沒有



1. A function  $f$  with domain  $\{1, 2, 3\}$  is defined by  $f(x) = 2^x$ . The range of  $f$  is

A  $\{\frac{1}{4}, \frac{1}{2}, \frac{1}{8}\}$

B  $\{\frac{1}{2}, 1, 1\frac{1}{2}\}$

C  $\{1, 2, 4\}$

D  $\{2, 4, 6\}$

E  $\{2, 4, 8\}$

Calculator used? Yes / No

1.

函數  $f$  的定義域是  $\{1, 2, 3\}$ ,  
它的定義是  $f(x) = 2^x$ .  
 $f$  的值域是

A  $\{\frac{1}{4}, \frac{1}{2}, \frac{1}{8}\}$

B  $\{\frac{1}{2}, 1, 1\frac{1}{2}\}$

C  $\{1, 2, 4\}$

D  $\{2, 4, 6\}$

E  $\{2, 4, 8\}$

有用計算機嗎? 有/沒有

2.

Which of the following,  
 $(x - 1), (x - 2), (x + 2), (x - 4)$   
are factors of  $x^3 - 4x^2 - x + 4$ ?

A Only  $(x - 1)$

B Only  $(x - 1)$  and  $(x + 2)$

C Only  $(x - 2)$  and  $(x + 2)$

D Only  $(x + 2)$  and  $(x - 4)$

E Only  $(x - 1)$  and  $(x - 4)$

Calculator used? Yes / No

2.

$(x - 1), (x - 2), (x + 2), (x - 4)$

下列何者為  $x^3 - 4x^2 - x + 4$   
之因子?

A 只有  $(x - 1)$

B 只有  $(x - 1)$  與  $(x + 2)$

C 只有  $(x - 2)$  與  $(x + 2)$

D 只有  $(x + 2)$  與  $(x - 4)$

E 只有  $(x - 1)$  與  $(x - 4)$

有用計算機嗎? 有/沒有

3.

Which of the following is negative?

A  $\sin \frac{5\pi}{12}$

B  $\sin \frac{5\pi}{8}$

C  $\tan \frac{5\pi}{6}$

D  $\tan \frac{5\pi}{4}$

E  $\cos \frac{5\pi}{3}$

Calculator used? Yes / No

3.

下列那一項的值是負

A  $\sin \frac{5\pi}{12}$

B  $\sin \frac{5\pi}{8}$

C  $\tan \frac{5\pi}{6}$

D  $\tan \frac{5\pi}{4}$

E  $\cos \frac{5\pi}{3}$

有用計算機嗎? 有

4.

$\int_1^2 \left(x - \frac{1}{x^2}\right) dx$  is equal to

A  $-3\frac{1}{8}$

B 1

C  $2\frac{5}{8}$

D 4

E  $4\frac{1}{2}$

Calculator used? Yes / No

4.

$\int_1^2 \left(x - \frac{1}{x^2}\right) dx$  等於

A  $-3\frac{1}{8}$

B 1

C  $2\frac{5}{8}$

D 4

E  $4\frac{1}{2}$

有用計算機嗎? 有 / 沒有

5.

A function  $f$  is defined by

$$f(x) = \begin{cases} -x - 1 & \text{if } -2 < x \leq -1 \\ x + 1 & \text{if } -1 < x \leq 0 \\ -x + 1 & \text{if } 0 < x \leq 1 \\ x - 1 & \text{if } 1 < x \leq 2 \end{cases}$$

Which is the graph of  $f$ ?

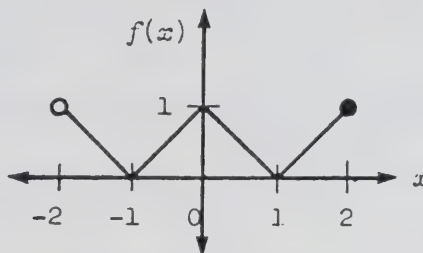
5.

函數  $f$  的定義是

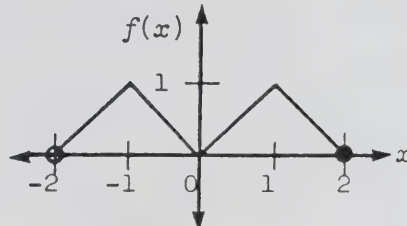
$$f(x) = \begin{cases} -x - 1 & \text{若 } -2 < x \leq -1 \\ x + 1 & \text{若 } -1 < x \leq 0 \\ -x + 1 & \text{若 } 0 < x \leq 1 \\ x - 1 & \text{若 } 1 < x \leq 2 \end{cases}$$

下列那一幅是  $f$  的圖像?

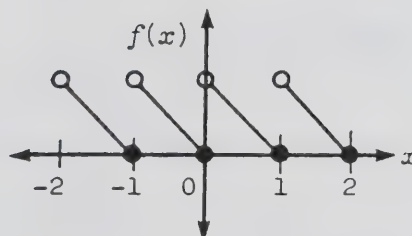
A



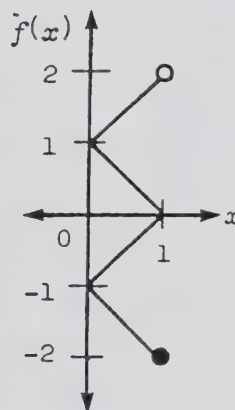
B



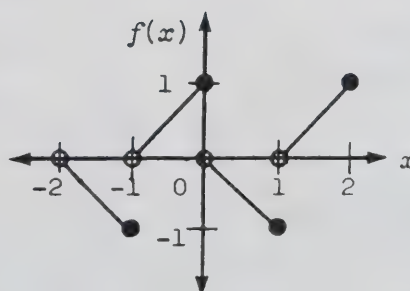
C



D



E



直是負值?

否? 有/沒有

有/沒有

Calculator used? Yes / No

有用計算機嗎? 有/沒有



6.

In the affine Euclidean plane, the coordinates (with respect to an orthogonal coordinate system) of a moving point  $M$  at time  $t \in \mathbb{R}_+$  are

$$x = e^{-t}$$

$$y = \log(1 + 2t)$$

The velocity vector at any time  $t$  is given by

A  $(e^{-t}, \log(1 + 2t))$

B  $(e^{-t}, \frac{1}{1 + 2t})$

C  $(-e^{-t}, \frac{2}{1 + 2t})$

D  $(-e^{-t}, \frac{1}{1 + 2t})$

E  $(-1, \frac{1}{t})$

Calculator used? Yes / No

6.

於仿射歐基里得平面中，在時間  $t \in \mathbb{R}_+$  一動點  $M$  的(直角)坐標是

$$x = e^{-t}$$

$$y = \log(1 + 2t)$$

對於任意時間  $t$ ， $M$  的速度向量是

A  $(e^{-t}, \log(1 + 2t))$

B  $(e^{-t}, \frac{1}{1 + 2t})$

C  $(-e^{-t}, \frac{2}{1 + 2t})$

D  $(-e^{-t}, \frac{1}{1 + 2t})$

E  $(-1, \frac{1}{t})$

有用計算機嗎？有/沒

7.

An angle  $\theta$  is known to be between  $90^\circ$  and  $180^\circ$  and  $\cos^2 \theta = \frac{16}{25}$ .

The value of  $\sin 2\theta$  is then

A  $-\frac{24}{25}$

B  $-\frac{15}{25}$

C  $-\frac{7}{25}$

D  $\frac{7}{25}$

E  $\frac{24}{25}$

Calculator used? Yes / No

7.

已知角  $\theta$  之大小在  $90^\circ$  與  $180^\circ$  之間，且  $\cos^2 \theta = \frac{16}{25}$ 。

那麼  $\sin 2\theta$  之值是

A  $-\frac{24}{25}$

B  $-\frac{15}{25}$

C  $-\frac{7}{25}$

D  $\frac{7}{25}$

E  $\frac{24}{25}$

有用計算機嗎？有/沒

中, 在時  
角(直角)

et)

的速度

8. Consider the three points in the Euclidean plane:

$A(2a, 0)$ ,  $B(a, 2a)$ , and  $C(0, a)$ , where  $a$  is a positive real number.

For any point  $M$  in the plane, let

$MA$ ,  $MB$ , and  $MC$  be the distances from  $M$  to  $A$ ,  $B$ , and  $C$ , respectively.

The set of points  $M$  such that

$$MA^2 + MB^2 + MC^2 = 10a^2$$

- A a circle with center  $(3a, 3a)$
- B a circle containing all 3 points  $A$ ,  $B$ ,  $C$ .
- C a circle of radius  $a\sqrt{\frac{10}{3}}$
- D a circle of radius  $a\sqrt{2}$
- E a circle or a line depending on the value of  $a$

Calculator used? Yes / No

有/沒有

9.

The speed of an object increases uniformly at a rate of 10% per second. At a given time, its speed is 10.00 meters per second. Three seconds later, its speed will be

- A 11.10 meters per second
- B 12.10 meters per second
- C 13.00 meters per second
- D 13.31 meters per second
- E 40.00 meters per second

Calculator used? Yes / No

0° 與 180°

有/沒有

8.

在歐基里得平面中, 有三點  $A(2a, 0)$ ,  $B(a, 2a)$ , 及  $C(0, a)$ , 其中  $a$  為正實數。對於平面中任何一點  $M$ ,  $MA$ ,  $MB$ , 與  $MC$  依次表示由  $M$  至  $A$ ,  $B$ , 及  $C$  之距離。

含  $M$  之集使

$$MA^2 + MB^2 + MC^2 = 10a^2$$

是

- A 一圓, 其圓心為  $(3a, 3a)$
- B 一過  $A$ ,  $B$ ,  $C$  三點之圓
- C 一圓, 其半徑為  $a\sqrt{\frac{10}{3}}$
- D 一圓, 其半徑為  $a\sqrt{2}$
- E 一圓或一直線, 視乎  $a$  之值

有用計算機嗎? 有/沒有

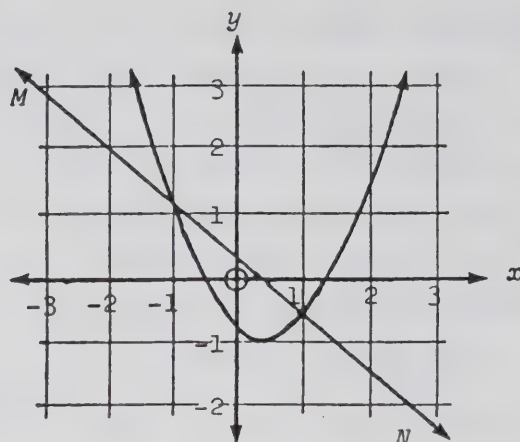
9.

一物體速率每秒增加 10%。在某一時間, 它的速率是每秒 10 米。三秒鐘後, 它的速率是

- A 每秒 11.10 米
- B 每秒 12.10 米
- C 每秒 13.00 米
- D 每秒 13.31 米
- E 每秒 40.00 米

有用計算機嗎? 有/沒有

10.



For what values of  $x$  does the function represented by the straight line  $MN$  exceed the quadratic function?

- A  $-1 < x < 1$
- B  $x < -1$  or  $x > 1$
- C  $-\frac{3}{4} < x < \frac{1}{4}$
- D  $x > 0$
- E  $x > y$

Calculator used? Yes / No

對於甚麼  $x$  值, 直線  $MN$  所表示的函數大於圖中的二次函數?

- A  $-1 < x < 1$
- B  $x < -1$  或  $x > 1$
- C  $-\frac{3}{4} < x < \frac{1}{4}$
- D  $x > 0$
- E  $x > y$

有用計算機嗎? 有/沒有

11.

A warning system installation consists of two independent alarms having probabilities of operating in an emergency of 0.95 and 0.90 respectively. Find the probability that at least one alarm operates in an emergency.

- A 0.995
- B 0.975
- C 0.95
- D 0.90
- E 0.855

Calculator used? Yes / No

11.

一警報系統, 設有兩個獨立警報裝置, 於意外發生時, 其奏效之概率分別是 0.95 及 0.90。試求於意外時, 最少有一警報奏效之概率。

- A 0.995
- B 0.975
- C 0.95
- D 0.90
- E 0.855

有用計算機嗎? 有/沒有



12.

If  $\frac{x-1}{x^2+3x+2} = \frac{P}{x+1} + \frac{Q}{x+2}$

then

A  $P = -2, Q = 3$

B  $P = -3, Q = 2$

C  $P = -1, Q = -2$

D  $P = 2, Q = -3$

E  $P = 3, Q = -2$

Calculator used? Yes / No

12.

如  $\frac{x-1}{x^2+3x+2} = \frac{P}{x+1} + \frac{Q}{x+2}$

則

A  $P = -2, Q = 3$

B  $P = -3, Q = 2$

C  $P = -1, Q = -2$

D  $P = 2, Q = -3$

E  $P = 3, Q = -2$

有用計算機嗎? 有/沒有

13.

The complex number  $(1+i)^2$  is equal to

A 0

B 2

C  $2i$

D  $1+i$

E  $2+2i$

Calculator used? Yes / No

13.

複數  $(1+i)^2$  等於

A 0

B 2

C  $2i$

D  $1+i$

E  $2+2i$

有用計算機嗎? 有/沒有

14.

A set of 24 cards is numbered with the positive integers from 1 to 24. If the cards are shuffled and if only one is selected at random, what is the probability that the number on the card is divisible by 4 or 6?

A  $\frac{1}{6}$

B  $\frac{5}{24}$

C  $\frac{1}{4}$

D  $\frac{1}{3}$

E  $\frac{5}{12}$

Calculator used? Yes / No

14.

有 24 張咭片，每張寫上了 1 至 24 的號碼。參攷後意取出一張咭片，問該片的號碼能被 4 或 6 除的概率是多少？

A  $\frac{1}{6}$

B  $\frac{5}{24}$

C  $\frac{1}{4}$

D  $\frac{1}{3}$

E  $\frac{5}{12}$

有用計算機嗎？ 有 / 沒有

15.

Which of the following is (are) true for all values of  $\theta$  for which the functions are defined?

- I  $\sin(-\theta) = -\sin \theta$   
 II  $\cos(-\theta) = -\cos \theta$   
 III  $\tan(-\theta) = -\tan \theta$

A I only

B II only

C III only

D I and III only

E II and III only

Calculator used? Yes / No

15.

下列那些對於變數  $\theta$  的公式在其函數的定義內是正確的？

- I  $\sin(-\theta) = -\sin \theta$   
 II  $\cos(-\theta) = -\cos \theta$   
 III  $\tan(-\theta) = -\tan \theta$

A 祇有 I

B 祇有 II

C 祇有 III

D 祇有 I 及 III

E 祇有 II 及 III

有用計算機嗎？ 有 / 沒有

16.

Which of the following graphs has these features:

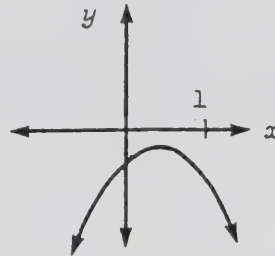
$f'(0) > 0$ ,  $f'(1) < 0$ , and  $f''(x)$  is always negative?

16.

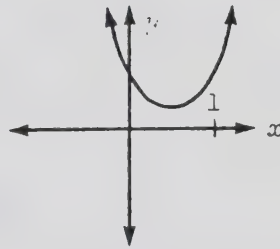
下列那一幅圖線有這樣的性質：

$f'(0) > 0$ ,  $f'(1) < 0$ , 及  $f''(x)$  恒為負值？

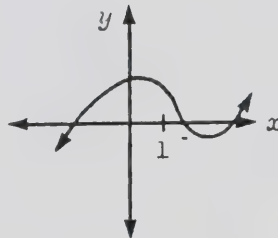
A



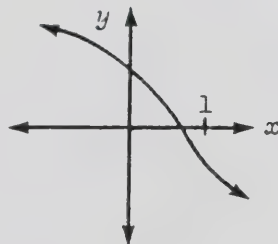
B



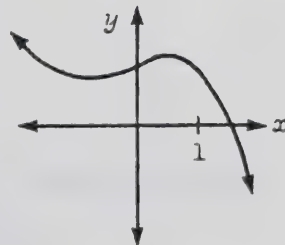
C



D



E



Calculator used?

Yes / No

有用計算機嗎？ 有/沒有



17.

The function  $f$  is defined for all real numbers by

$$f(x) = \frac{x^2 - 4x + 3}{x - 1}$$

when  $x \neq 1$ , and is continuous at  $x = 1$ . Then  $f(1)$  is equal to

A -3

B -2

C 0

D 1

E 4

Calculator used? Yes / No

17.

函數  $f$  的定義域是所有實數。當  $x \neq 1$  時， $f$  的定義是

$$f(x) = \frac{x^2 - 4x + 3}{x - 1}$$

$f$  在  $x = 1$  時是連續的。麼  $f(1)$  等於

A -3

B -2

C 0

D 1

E 4

有用計算機嗎？有 / 沒有

- END -

- 完 -



INTERNATIONAL ASSOCIATION for the  
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BOOKLET 12

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

是所有實  
的定義

3

續的。那

有/沒有

# INSTRUCTIONS FOR STUDENTS

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## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

☒ A   ☐ B   ☐ C   ☐ D   ☐ E  
 Calculator used? ☒ Yes   ☐ No  
 有利用計算機嗎? 有   沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

☒ A   ☐ B   ☐ C   ☐ D   ☐ E  
 Calculator used? ☒ Yes   ☐ No  
 有利用計算機嗎? 有   沒有



1.

If  $a = 2^3 \cdot 5^2 \cdot 7$  and  $b = 3^2 \cdot 5^3 \cdot 7^2 \cdot 11$   
then the least common multiple  
(LCM) of  $a$  and  $b$  is

- A  $5^2 \cdot 7$   
B  $2^3 \cdot 3^2 \cdot 5^2 \cdot 7 \cdot 11$   
C  $2^3 \cdot 3^2 \cdot 5^3 \cdot 7^2 \cdot 11$   
D  $2^3 \cdot 3^2 \cdot 5^5 \cdot 7^3 \cdot 11$   
E  $2^3 \cdot 3^2 \cdot 5^6 \cdot 7^2 \cdot 11$

Calculator used? Yes / No

1.

若  $a = 2^3 \cdot 5^2 \cdot 7$  及  $b = 3^2 \cdot 5^3 \cdot 7^2 \cdot 11$ ,  
則  $a$  與  $b$  的最小公倍數  
(LCM) 是

- A  $5^2 \cdot 7$   
B  $2^3 \cdot 3^2 \cdot 5^2 \cdot 7 \cdot 11$   
C  $2^3 \cdot 3^2 \cdot 5^3 \cdot 7^2 \cdot 11$   
D  $2^3 \cdot 3^2 \cdot 5^5 \cdot 7^3 \cdot 11$   
E  $2^3 \cdot 3^2 \cdot 5^6 \cdot 7^2 \cdot 11$

有用計算機嗎? 有/沒有

2.

According to one plan for traveling  
to Mars, the round trip would take  
almost exactly 3 years, including a  
stay on Mars of 449 Earth days. If  
one must travel 34,000,000 miles each  
way on the trip, which of the follow-  
ing can be used to estimate the average  
speed of travel in miles per hour?

- A  $\frac{(3 \times 365 - 449) \times 24}{34,000,000}$   
B  $\frac{(3 \times 365 - 449) \times 24}{34,000,000 \times 2}$   
C  $\frac{34,000,000}{(3 \times 365 - 449) \times 24}$   
D  $\frac{34,000,000 \times 24}{2 \times (3 \times 365 - 449)}$   
E  $\frac{2 \times 34,000,000}{(3 \times 365 - 449) \times 24}$

Calculator used? Yes / No

2. 根據一項前往火星探險的計劃,  
來回需時 3 年, 其中有 449 日  
(地球日) 在火星逗留。若前往  
火星或從火星返回地球每程  
皆需在太空旅行 34,000,000 哩,  
問下列那一項可用以估計平均  
速度(以每小時若干哩計)?

- A  $\frac{(3 \times 365 - 449) \times 24}{34,000,000}$   
B  $\frac{(3 \times 365 - 449) \times 24}{34,000,000 \times 2}$   
C  $\frac{34,000,000}{(3 \times 365 - 449) \times 24}$   
D  $\frac{34,000,000 \times 24}{2 \times (3 \times 365 - 449)}$   
E  $\frac{2 \times 34,000,000}{(3 \times 365 - 449) \times 24}$

有用計算機嗎? 有/沒有

3.

If  $x$  is a real number, then  $y$ , defined by  $y = \sqrt{x^2 - 1}$ , is a real number for

- A All real values of  $x$
- B  $x = 0$
- C All non-negative real values of  $x$
- D  $x \leq -1$  or  $x \geq 1$
- E  $-1 \leq x \leq 1$

Calculator used? Yes / No

3.

若  $x$  為實數，而  $y$  被定義為  $y = \sqrt{x^2 - 1}$ ，試列出  $x$  之值其能使  $y$  亦為實數

- A 所有實數
- B  $x = 0$
- C 所有非負實數
- D  $x \leq -1$  或  $x \geq 1$
- E  $-1 \leq x \leq 1$

有用計算機嗎？ 有 / 沒有

4.

Given that  $3f'(x) = x^2 - 5$ , and  $f(2) = 1$ , then  $f(0)$  is equal to

- A  $-\frac{5}{3}$
- B  $-\frac{2}{3}$
- C  $\frac{1}{3}$
- D  $\frac{25}{9}$
- E  $\frac{31}{9}$

Calculator used? Yes / No

4.

已知  $3f'(x) = x^2 - 5$  及  $f(2) = 1$ ，則  $f(0)$  等於

- A  $-\frac{5}{3}$
- B  $-\frac{2}{3}$
- C  $\frac{1}{3}$
- D  $\frac{25}{9}$
- E  $\frac{31}{9}$

有用計算機嗎？ 有 / 沒有

5.

What are all values of  $x$  for which the inequality

$$5x + \frac{5}{3} \leq -2x - \frac{2}{3}$$

is true?

A  $x \leq -\frac{7}{9}$

B  $x \leq -\frac{1}{3}$

C  $x \geq 0$

D  $x \geq \frac{7}{3}$

E  $x \geq \frac{2}{3}$

Calculator used? Yes / No

5.

試列出所有  $x$  之值使不等式

$$5x + \frac{5}{3} \leq -2x - \frac{2}{3}$$

為真。

A  $x \leq -\frac{7}{9}$

B  $x \leq -\frac{1}{3}$

C  $x \geq 0$

D  $x \geq \frac{7}{3}$

E  $x \geq \frac{2}{3}$

有用計算機嗎? 有 / 沒有

6.

The function  $f$  is defined by

$$f(x) = \int_0^x \sqrt{1+u^2} du$$

$f''(2)$  is equal to

A  $\sqrt{5} - 1$

B  $\sqrt{5}$

C  $2\sqrt{5}$

D  $\frac{1}{\sqrt{5}}$

E  $\frac{2}{\sqrt{5}}$

Calculator used? Yes / No

6.

函數  $f$  之定義為

$$f(x) = \int_0^x \sqrt{1+u^2} du.$$

$f''(2)$  等於

A  $\sqrt{5} - 1$

B  $\sqrt{5}$

C  $2\sqrt{5}$

D  $\frac{1}{\sqrt{5}}$

E  $\frac{2}{\sqrt{5}}$

有用計算機嗎? 有 / 沒有



7.

If  $\cos \theta = \frac{1}{2}$ , then  $\cos 2\theta$  is equal to

A  $-\frac{1}{2}$

B  $\frac{1}{2}$

C  $-\frac{\sqrt{3}}{2}$

D  $\frac{\sqrt{3}}{2}$

E 1

Calculator used? Yes / No

7.

若  $\cos \theta = \frac{1}{2}$ , 則  $\cos 2\theta$  等於

A  $-\frac{1}{2}$

B  $\frac{1}{2}$

C  $-\frac{\sqrt{3}}{2}$

D  $\frac{\sqrt{3}}{2}$

E 1

有用計算機嗎? 有/沒有

8.

Let  $f$  be the mapping from the complex plane  $C$  to  $C$  which maps  $z$  into  $z'$

such that  $z' = (1-i)z + 4$

Which of the following describes  $f$ ?

A  $f$  is a translationB  $f$  is a rotation about  $(0, -4)$  through an angle  $-\frac{\pi}{4}$ C  $f$  is a size translation of magnitude 2 and center  $(0, -4)$ D  $f$  is a similarity transformation of magnitude  $\sqrt{2}$  and center  $(0, 4)$  through an angle of  $-\frac{\pi}{4}$ E  $f$  is a similarity transformation of magnitude  $\sqrt{2}$  and center  $(0, -4)$  through an angle of  $-\frac{\pi}{4}$ 

Calculator used? Yes / No

8.

設  $f$  為一由複平面  $C$  至  $C$  的映射, 其將  $z$  映射到  $z'$  使到  $z' = (1-i)z + 4$ .

下列那一項正確描述  $f$ ?

A  $f$  是 - 平移B  $f$  是 - 旋轉, 以  $(0, -4)$  為中心, 以  $-\frac{\pi}{4}$  為旋轉角.C  $f$  是 - 放大變換, 以  $(0, -4)$  為中心, 以 2 為放大因子D  $f$  是 - 相似變換, 以  $(0, 4)$  為中心, 以  $\sqrt{2}$  為放大因子, 以  $-\frac{\pi}{4}$  為旋轉角.E  $f$  是 - 相似變換, 以  $(0, -4)$  為中心, 以  $\sqrt{2}$  為放大因子, 以  $-\frac{\pi}{4}$  為旋轉角.

有用計算機嗎? 有/沒有

9.

If  $n$  distinct points are marked on a circle, how many chords may be obtained by joining them?

- A  $n$
- B  $\frac{n}{2}$
- C  $n - 1$
- D  $n(n - 1)$
- E  $\frac{n(n - 1)}{2}$

Calculator used? Yes / No

9.

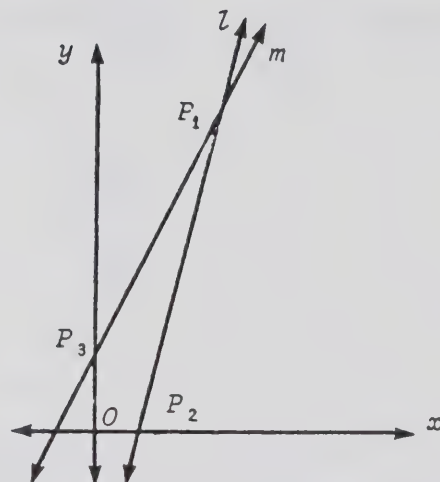
若在圓周上取  $n$  不同點，  
並將每兩點以直綫相連，  
問共可作弦多少條？

- A  $n$
- B  $\frac{n}{2}$
- C  $n - 1$
- D  $n(n - 1)$
- E  $\frac{n(n - 1)}{2}$

有用計算機嗎？有／沒有

B5

10.



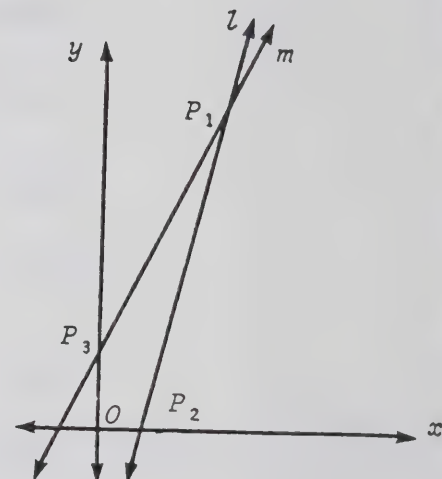
The equation of line  $l$  is  $y = 4x - 5$ .  
 The equation of line  $m$  is  $y = 2x + 2$ .  
 What is the solution of the simultaneous equations

$$\begin{aligned} y &= 4x - 5 \\ y &= 2x + 2 \end{aligned}$$

- A The coordinates of  $P_1$
- B The coordinates of  $P_2$
- C The coordinates of  $P_3$
- D The  $x$ -value at  $P_2$  and the  $y$ -value at  $P_3$
- E The  $y$ -value at  $P_2$  and the  $x$ -value at  $P_3$

Calculator used? Yes / No

10.



直线  $l$  的方程 是  $y = 4x - 5$ .  
 直线  $m$  的方程 是  $y = 2x + 2$ .  
 問聯立方程

的解是甚麼?  
 $y = 4x - 5$   
 $y = 2x + 2$

- A  $P_1$  的坐標
- B  $P_2$  的坐標
- C  $P_3$  的坐標
- D  $P_2$  的  $x$  值及  $P_3$  的  $y$  值
- E  $P_2$  的  $y$  值及  $P_3$  的  $x$  值

有用計算機嗎? 有/沒有



11.

The function  $f$ , defined by

$$f(x) = \frac{(x-1)(3x+1)}{(2x-1)(x-2)},$$

is negative for all  $x$  such that

- A  $-\frac{1}{3} < x < 3$
- B  $\frac{1}{2} < x < 2$
- C  $1 < x < 3$
- D  $\frac{1}{2} < x < 2$  or  $2 < x < 3$
- E  $-\frac{1}{3} < x < \frac{1}{2}$  or  $1 < x < 2$

Calculator used? Yes / No

11.

函數  $f$  的定義是

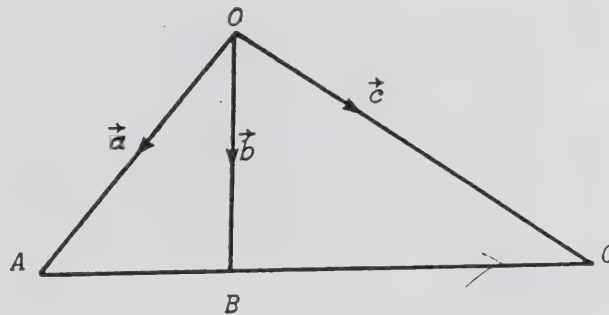
$$f(x) = \frac{(x-1)(3x+1)}{(2x-1)(x-2)}.$$

試列出所有  $x$  之值使此函數為負值。

- A  $-\frac{1}{3} < x < 3$
- B  $\frac{1}{2} < x < 2$
- C  $1 < x < 3$
- D  $\frac{1}{2} < x < 2$  或  $2 < x < 3$
- E  $-\frac{1}{3} < x < \frac{1}{2}$  或  $1 < x < 2$

有用計算機嗎? 有/沒有

12.



Point  $B$  is on line  $\overleftrightarrow{AC}$ . If  $\overrightarrow{AC} = 3 \overrightarrow{AB}$ , then  $\vec{c}$  is equal to

- A  $2\vec{a} + 3\vec{b}$
- B  $15\vec{b} - 10\vec{a}$
- C  $3\vec{b} - 2\vec{a}$
- D  $10\vec{a} - 15\vec{b}$
- E  $2\vec{a} - 3\vec{b}$

Calculator used? Yes / No

點  $B$  是在線段  $\overline{AC}$  上。若  $\overline{AC} = 3 \overline{AB}$ , 則  $\vec{c}$  等於

- A  $2\vec{a} + 3\vec{b}$
- B  $15\vec{b} - 10\vec{a}$
- C  $3\vec{b} - 2\vec{a}$
- D  $10\vec{a} - 15\vec{b}$
- E  $2\vec{a} - 3\vec{b}$

有用計算機嗎? 有/沒有

13.

The function  $f$  defined by  
 $f(x) = x^4 + 4x^3 + 4x^2 + 5$  has a  
 relative maximum at

A  $x = -2$

B  $x = -1$

C  $x = 0$

D  $x = 1$

E  $x = 2$

Calculator used? Yes / No

13.

函數  $f$  之定義是

$$f(x) = x^4 + 4x^3 + 4x^2 + 5.$$

它有一相對極大值在

A  $x = -2$

B  $x = -1$

C  $x = 0$

D  $x = 1$

E  $x = 2$

有用計算機嗎? 有/沒

14.

The rectangular coordinates of  
 three points in a plane are  
 $Q(-3, -1)$ ,  $R(-2, 3)$  and  $S(1, -3)$ .  
 A fourth point  $T$  is chosen so that  
 $\vec{ST} = 2\vec{QR}$ . The  $y$ -coordinate of  $T$   
 is

A  $-11$

B  $-7$

C  $-1$

D  $1$

E  $5$

Calculator used? Yes / No

14.

一平面上有三點, 它們的  
 角坐標分別是  $Q(-3, -1)$ ,  $R$   
 及  $S(1, -3)$ . 有第四點  $T$  且  
 $\vec{ST} = 2\vec{QR}$ .  $T$  的  $y$  坐標是

A  $-11$

B  $-7$

C  $-1$

D  $1$

E  $5$

有用計算機嗎? 有/沒有

15. If  $x = 2 \cos t$  and  $y = \sin t$ , find  $\frac{dy}{dx}$  in terms of  $t$ .

A  $\frac{1}{2} \tan t$

B  $2 \tan t$

C  $\frac{1}{2} \cot t$

D  $-\frac{1}{2} \cot t$

E  $-2 \cot t$

Calculator used? Yes / No

15. 若  $x = 2 \cos t$  及  $y = \sin t$ , 求  $\frac{dy}{dx}$  並以  $t$  表之。

A  $\frac{1}{2} \tan t$

B  $2 \tan t$

C  $\frac{1}{2} \cot t$

D  $-\frac{1}{2} \cot t$

E  $-2 \cot t$

有用計算機嗎? 有/沒有

16. When  $(1 + p)^6$  is expanded, the coefficient of  $p^4$  is

A 6

B 10

C 15

D 20

E 30

Calculator used? Yes / No

16. 在  $(1 + p)^6$  的展開式中,  $p^4$  的係數是

A 6

B 10

C 15

D 20

E 30

有用計算機嗎? 有/沒有

17.  $f$  is an even function and is differentiable at 0. What condition must  $f'(0)$  satisfy?

A  $f'(0) = 1$

B  $f'(0) > 0$

C  $f'(0) < 0$

D  $f'(0) = 0$

E  $f'(0)$  can assume any value

Calculator used? Yes / No - END -

17.  $f$  是一偶函數, 且在變數等於 0 時可微。那麼  $f'(0)$  須滿足什麼條件?

A  $f'(0) = 1$

B  $f'(0) > 0$

C  $f'(0) < 0$

D  $f'(0) = 0$

E  $f'(0)$  可取任何值

有用計算機嗎? 有/沒有





INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 13

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS

HONG KONG 1980/81

## INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a **SOFT HB** pencil throughout the whole test.
3. Fill in **ALL** your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

### EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? Yes No  
有使用計算機 沒有使用

## 學生須知

1. 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後，如果你有時間，你可以再答你留空了的問題。
2. 在整個測驗中，請用‘粗’的 HB 鉛筆作答。
3. 在答案紙的上端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

### 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used? Yes No  
有使用計算機 沒有使用

1.

$$3a^{\frac{1}{2}} \times 3a^{-\frac{1}{2}} =$$

A  $9a^{-\frac{1}{4}}$

B  $9a$

C  $0$

D  $1$

E  $9$

Calculator used? Yes / No

1.

$$3a^{\frac{1}{2}} \times 3a^{-\frac{1}{2}} =$$

A  $9a^{-\frac{1}{4}}$

B  $9a$

C  $0$

D  $1$

E  $9$

有用計算機嗎? 有/沒有

2.

$$\lim_{x \rightarrow +\infty} \frac{(2x+1)(x+1)}{3x^2-2} \text{ is equal to}$$

A  $-\frac{1}{2}$

B  $\frac{2}{3}$

C  $1$

D  $6$

E  $\infty$

Calculator used? Yes / No

2.

$$\lim_{x \rightarrow +\infty} \frac{(2x+1)(x+1)}{3x^2-2} \text{ 等於}$$

A  $-\frac{1}{2}$

B  $\frac{2}{3}$

C  $1$

D  $6$

E  $\infty$

有用計算機嗎? 有/沒有



3.

If  $3^{x+y} = 81$  and  $25^{\frac{x}{2}} = 5$ ,  
then  $y$  is

A 0

B 2

C 3

D  $\frac{7}{2}$ E  $\frac{15}{4}$ 

Calculator used? Yes / No

3.

若  $3^{x+y} = 81$  及  $25^{\frac{x}{2}} = 5$ ,  
則  $y$  等於

A 0

B 2

C 3

D  $\frac{7}{2}$ E  $\frac{15}{4}$ 

有用計算機嗎? 有/沒有

4.

A function  $f$  is defined by  
 $f(x) = (3x + 1)^6$ .  
The derivative of  $f$  at  $x$  is

A  $18x^5$ B  $6(3x + 1)^5$ C  $18(3x + 1)^5$ D  $3^6 \times 6x^5$ E  $3^6$ 

Calculator used? Yes / No

4.

函數  $f$  的定義是  
 $f(x) = (3x + 1)^6$   
 $f$  在  $x$  的導數是

A  $18x^5$ B  $6(3x + 1)^5$ C  $18(3x + 1)^5$ D  $3^6 \times 6x^5$ E  $3^6$ 

有用計算機嗎? 有/沒有

5.

In the interval  $2\pi \leq x \leq 4\pi$ ,  
the solution set of the equation  
 $\sin x = \frac{1}{2}$  is

A  $\{\frac{7\pi}{3}, \frac{8\pi}{3}\}$

B  $\{\frac{7\pi}{3}, \frac{11\pi}{3}\}$

C  $\{\frac{13\pi}{6}, \frac{17\pi}{6}\}$

D  $\{\frac{13\pi}{6}, \frac{19\pi}{6}\}$

E  $\{\frac{13\pi}{6}, \frac{23\pi}{6}\}$

Calculator used? Yes / No

5.

在區間  $2\pi \leq x \leq 4\pi$  內,  
方程  $\sin x = \frac{1}{2}$  之解答  
集是

A  $\{\frac{7\pi}{3}, \frac{8\pi}{3}\}$

B  $\{\frac{7\pi}{3}, \frac{11\pi}{3}\}$

C  $\{\frac{13\pi}{6}, \frac{17\pi}{6}\}$

D  $\{\frac{13\pi}{6}, \frac{19\pi}{6}\}$

E  $\{\frac{13\pi}{6}, \frac{23\pi}{6}\}$

有用計算機嗎? 有/沒有

6.

Let  $l$  and  $m$  be two intersecting  
lines in the Euclidean plane, and  
let  $\vec{v}$  be a non-zero vector. Let

$S_l$  indicate a reflection in the  
line  $l$ ,

$S_m$  indicate a reflection in the  
line  $m$ , and

$T$  indicate a translation of vector  $\vec{v}$

Which of the following transformations  
is a rotation?

A  $S_l \circ T$

B  $S_m \circ S_l \circ T$

C  $S_l \circ T \circ S_m \circ S_l \circ T$

D  $T \circ S_m$

E  $S_m \circ S_l \circ S_m$

Calculator used? Yes / No

6.

$l$  及  $m$  是歐基里得平面內  
的兩相交直線。 $\vec{v}$  是一非零  
向量。

以  $S_l$  表示對直線  $l$  的反射,

以  $S_m$  表示對直線  $m$  的反射,

以  $T$  表向量  $\vec{v}$  的平移。

下列那一項是一旋轉變換?

A  $S_l \circ T$

B  $S_m \circ S_l \circ T$

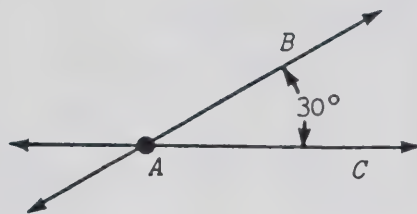
C  $S_l \circ T \circ S_m \circ S_l \circ T$

D  $T \circ S_m$

E  $S_m \circ S_l \circ S_m$

有用計算機嗎? 有/沒有

7.

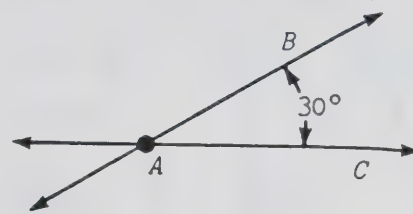


As  $\overline{AB}$  rotates about  $\overline{AC}$  in space, keeping an angle of  $30^\circ$ , what figure is traced out by the line  $\overline{AB}$ ?

- A a cone
- B a cylinder
- C a spiral
- D a circle
- E a sphere

Calculator used? Yes / No

7.



$\overline{AB}$  繞  $\overline{AC}$  在空間旋轉, 而它們之夾角保持在  $30^\circ$ 。問  $\overline{AB}$  所產生的立體是甚麼?

- A 一圓錐體
- B 一圓柱體
- C 一螺旋
- D 一圓形
- E 一球體

有用計算機嗎? 有/沒有

8.

What is the equation in  $x$  and  $y$  of the curve with parametric equations

$$x = t + \frac{1}{t}, \quad y = t - \frac{1}{t}?$$

- A  $x + y = 1$
- B  $x + y = 2$
- C  $x^2 + y^2 = 4$
- D  $x^2 - y^2 = 4$
- E  $2x^2 - y^2 = 4$

Calculator used? Yes / No

8. 某曲線的參數方程是

$$x = t + \frac{1}{t}, \quad y = t - \frac{1}{t}.$$

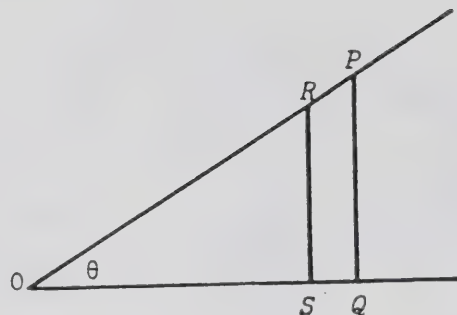
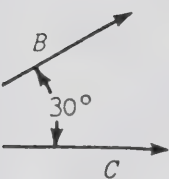
試以  $x$  及  $y$  表該曲線的方程。

- A  $x + y = 1$
- B  $x + y = 2$
- C  $x^2 + y^2 = 4$
- D  $x^2 - y^2 = 4$
- E  $2x^2 - y^2 = 4$

有用計算機嗎? 有/沒有



9.

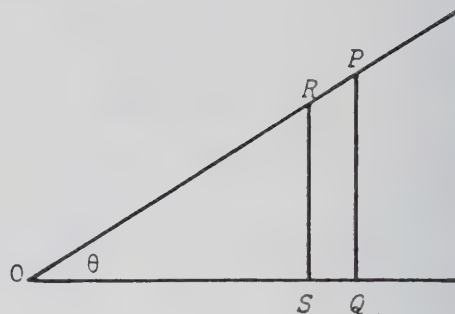


In the figure above,  $PQ \perp OQ$  and  $RS \perp OQ$ . If the measures of  $OQ$  and of  $OR$  equal 1 and  $\theta$  is the measure of  $\angle POQ$ , then the measure of segment  $PQ$  is equal to

- A  $\sin \theta$
- B  $\cos \theta$
- C  $\tan \theta$
- D  $2 \sin \theta$
- E  $1 - \cos \theta$

Calculator used? Yes / No

9.



上圖中,  $PQ \perp OQ$  及  $RS \perp OQ$ . 若  $OQ$  及  $OR$  的長度均為 1, 及  $\angle POQ$  的大小為  $\theta$ , 則線段  $PQ$  的長度是

- A  $\sin \theta$
- B  $\cos \theta$
- C  $\tan \theta$
- D  $2 \sin \theta$
- E  $1 - \cos \theta$

有用計算機嗎? 有/沒有

10.

The same test was given in two classes. The first class, with 20 pupils, obtained an average score of 12.3 points. The second class, which had 30 pupils, obtained an average score of 14.8 points. What was the average score of the whole group of 50 pupils?

- A 12.55
- B 13.3
- C 13.55
- D 13.8
- E 14.3

Calculator used? Yes / No

10.

有甲、乙兩班學生做同一測驗, 甲班有 20 人, 他們的平均分是 12.3。乙班有 30 人, 他們的平均分是 14.8。問全班 50 人的平均分是多少?

- A 12.55
- B 13.3
- C 13.55
- D 13.8
- E 14.3

有用計算機嗎? 有/沒有

11.

If  $a$  is a digit, let  $.\bar{a}$  be the number with decimal expansion  $.aaaaaa....$

What is

$$.\bar{7} + .\bar{4} ?$$

A 1.1

B  $1.\bar{1}$ 

C 1.2

D  $1.\bar{2}$ 

E 1.3

Calculator used? Yes / No

12.

A freight train travelling at 50 kilometers per hour leaves a station 3 hours before an express train which travels in the same direction at 90 kilometers an hour. How many hours will it take the express train to overtake the freight train?

A  $\frac{5}{9}$ B  $\frac{9}{5}$ C  $\frac{12}{5}$ D  $\frac{15}{4}$ E  $\frac{18}{4}$ 

Calculator used? Yes / No

11.

若  $a$  是個一位數, 設  $.\bar{a}$  表示無窮循環小數

$.aaaaaa....$

$.\bar{7} + .\bar{4}$  等於甚麼?

A 1.1

B  $1.\bar{1}$ 

C 1.2

D  $1.\bar{2}$ 

E 1.3

有用計算機嗎? 有 / 沒有

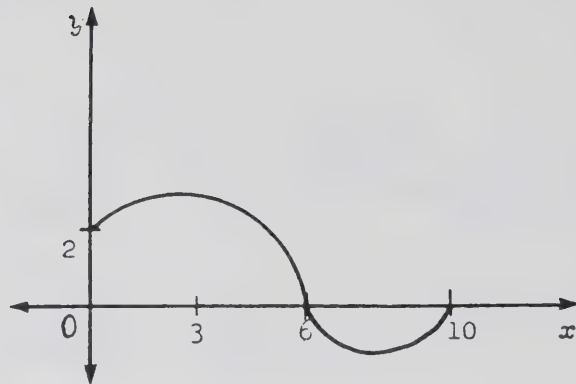
12.

一列慢車與一列快車同向而行, 慢車比快車先 3 小時開出。慢車的速率是每小時 50 千米, 快車的速率是每小時 90 千米。問快車開行後, 需若干小時方可追及慢車?

A  $\frac{5}{9}$ B  $\frac{9}{5}$ C  $\frac{12}{5}$ D  $\frac{15}{4}$ E  $\frac{18}{4}$ 

有用計算機嗎? 有 / 沒有

13.



The graph of the function  $f$  is shown above for  $0 \leq x \leq 10$ .

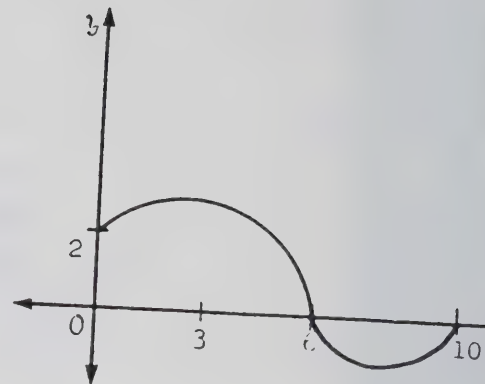
$\int_0^a f(x) dx$  attains its greatest

value when  $a$  is equal to

- A 0
- B 2
- C 3
- D 6
- E 10

Calculator used? Yes / No

13.



√ 圖為函數  $f$  在區間  $0 \leq x \leq 10$  的圖像。問當  $a$  取甚麼值時，

$\int_0^a f(x) dx$  達至它的極大值？

- A 0
- B 2
- C 3
- D 6
- E 10

有用計算機嗎？ 有 / 沒有

14.

The mappings  $f, g, h$  from the real line  $\mathbb{R}$  into the real plane  $\mathbb{R}^2$  are defined by

$$f: x \longrightarrow (e^x, 3x)$$

$$g: x \longrightarrow (2x-3, 7-x)$$

$$h: x \longrightarrow (\sin x, \cos x)$$

Which of those mappings are linear transformations?

- A only  $f$
- B only  $g$
- C only  $h$
- D  $f, g$  and  $h$
- E none of them

Calculator used? Yes / No

14.

$f, g, h$  是由實線  $\mathbb{R}$  至實平面  $\mathbb{R}^2$  之映射，其定義依次是

$$f: x \longrightarrow (e^x, 3x)$$

$$g: x \longrightarrow (2x-3, 7-x)$$

$$h: x \longrightarrow (\sin x, \cos x)$$

那些映射是線性變換？

- A 只有  $f$
- B 只有  $g$
- C 只有  $h$
- D  $f, g$  及  $h$
- E 無一是

有用計算機嗎？ 有 / 沒有



15.

A piece of wire 52 cm long is cut into two parts and each part is bent to form a square. The total area of the two squares is  $97 \text{ cm}^2$ . How much longer (in cm) is a side of the larger square than a side of the smaller square?

A 4

B 5

C 9

D 14

E 20

Calculator used? Yes / No

15.

一鐵線長 52 cm 將要分成兩段,然後每段分別用以圍成一正方形。兩正方形的總面積是  $97 \text{ cm}^2$ 。問大正方形的邊長比小正方形的邊長多若干 cm?

A 4

B 5

C 9

D 14

E 20

有用計算機嗎? 有/沒有

16.

The value of

$$\int_0^1 \frac{dx}{x^2 - 5x + 6} \text{ is:}$$

A  $\frac{1}{2} \log_e 2$ B  $\frac{1}{3}$ C  $\log_e \frac{4}{3}$ D  $\tan^{-1} \frac{1}{4}$ E  $\frac{1}{2}$ 

Calculator used? Yes / No

16.

$$\int_0^1 \frac{dx}{x^2 - 5x + 6} \text{ 等於}$$

A  $\frac{1}{2} \log_e 2$ B  $\frac{1}{3}$ C  $\log_e \frac{4}{3}$ D  $\tan^{-1} \frac{1}{4}$ E  $\frac{1}{2}$ 

有用計算機嗎? 有/沒有

17.

 $\int \sqrt{x-1} \, dx$  is equal to

A  $\frac{2}{3} (x-1)^{\frac{3}{2}} + c$

B  $(\frac{x^2}{2} - x)^{\frac{3}{2}} + c$

C  $\frac{1}{2}(x-1) + c$

D  $(x-1)^{\frac{3}{2}} + c$

E  $\frac{1}{2\sqrt{x-1}} + c$

Calculator used? Yes / No

有/沒有

17.

 $\int \sqrt{x-1} \, dx$  等於

A  $\frac{2}{3} (x-1)^{\frac{3}{2}} + c$

B  $(\frac{x^2}{2} - x)^{\frac{3}{2}} + c$

C  $\frac{1}{2}(x-1) + c$

D  $(x-1)^{\frac{3}{2}} + c$

E  $\frac{1}{2\sqrt{x-1}} + c$

有用計算機嗎? 有/沒有

- END -

- 完 -

B6

等於

有/沒有



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 14

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81



# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used? ☒ Yes ☐ No  
有使用計算機嗎? ☒ 是 ☐ 否

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類の問題。因為這測驗是國際性的, 所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的問題。然後, 如果你有時間, 你可以再答你留空了的問題。
2. 在整個測驗中, 請用 '粗' 的 HB 鉛筆作答。
3. 在答案紙的上端, 請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答, 你須將答案空格如下填上:

Calculator used? ☒ Yes ☐ No  
有使用計算機嗎? ☒ 是 ☐ 否

1.

If  $x$  and  $y$  are real numbers,  
for which  $x$  can you define  $y$  by

$$y = \frac{x}{\sqrt{9 - x^2}} ?$$

- A All  $x$  except  $x = 3$
- B All  $x$  except  $x = 3$  and  $x = -3$
- C  $x < -3$  or  $x > 3$
- D  $-3 < x < 3$
- E  $x < 3$

Calculator used? Yes / No

1.

設  $x$  及  $y$  均為實數。對於  
甚麼  $x$  值我們可將  $y$  定  
義為

$$y = \frac{x}{\sqrt{9 - x^2}} ?$$

- A 所有  $x$  除却  $x = 3$
- B 所有  $x$  除却  $x = 3$  及  $x = -3$
- C  $x < -3$  或  $x > 3$
- D  $-3 < x < 3$
- E  $x < 3$

有用計算機嗎? 有/沒有

2.

The slope of the line through  
the two points  $(-1, 3)$  and  $(4, -7)$   
is

- A  $-\frac{1}{2}$
- B  $-\frac{3}{4}$
- C  $-\frac{4}{3}$
- D  $-2$
- E  $-\frac{10}{3}$

Calculator used? Yes / No

2.

過點  $(-1, 3)$  及  $(4, -7)$  的直  
線之斜率為

- A  $-\frac{1}{2}$
- B  $-\frac{3}{4}$
- C  $-\frac{4}{3}$
- D  $-2$
- E  $-\frac{10}{3}$

有用計算機嗎? 有/沒有

3.

How many four-digit numbers less than 2467 can be formed from the digits 1, 2, 3, 4 using each digit once?

A  $2 \times 3 \times 2 \times 1$

B  $2 + 3 + 2 + 1$

C  $4 \times 3 \times 2 \times 1$

D  $4 + 3 + 2 + 1$

E  $1 \times 3 \times 2 \times 1$

Calculator used? Yes / No

3.

若將數字 1, 2, 3, 4 排成一個四位数(每個數字祇准一次), 問可排成多少個小於 2467 的數?

A  $2 \times 3 \times 2 \times 1$

B  $2 + 3 + 2 + 1$

C  $4 \times 3 \times 2 \times 1$

D  $4 + 3 + 2 + 1$

E  $1 \times 3 \times 2 \times 1$

有用計算機嗎? 有/沒有

4.

If  $z = \cos \frac{\pi}{6} + i \sin \frac{\pi}{6}$ ,  
then  $z^3$  is equal to

A 0

B 1

C  $i$

D  $\frac{3\sqrt{3}}{8} + \frac{i}{8}$

E  $\frac{3\sqrt{3}}{8} - \frac{i}{8}$

Calculator used? Yes / No

4.

若  $z = \cos \frac{\pi}{6} + i \sin \frac{\pi}{6}$ ,  
則  $z^3$  等於

A 0

B 1

C  $i$

D  $\frac{3\sqrt{3}}{8} + \frac{i}{8}$

E  $\frac{3\sqrt{3}}{8} - \frac{i}{8}$

有用計算機嗎? 有/沒有

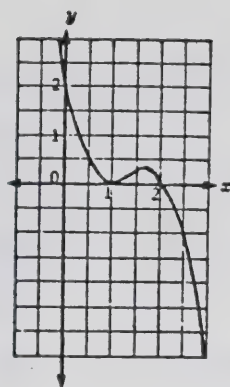


排成一  
字祇能用  
一個小於

有/沒有

/沒有

5.



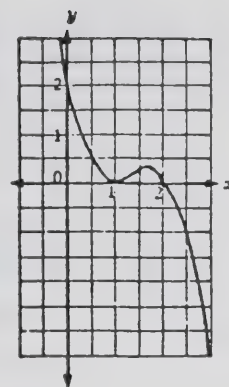
The graph above is the representation of one of the following equations. Which one does it represent?

- A  $y = (1 - x)(x - 2)$
- B  $y = (1 - x)(2 - x)$
- C  $y = (1 - x)(2 - x)^2$
- D  $y = (1 - x)^2(x - 2)$
- E  $y = (1 - x)^2(2 - x)$

Calculator used? Yes / No

4

5.



上列的圖像表示下列一個方程。這方程是那一個?

- A  $y = (1 - x)(x - 2)$
- B  $y = (1 - x)(2 - x)$
- C  $y = (1 - x)(2 - x)^2$
- D  $y = (1 - x)^2(x - 2)$
- E  $y = (1 - x)^2(2 - x)$

有用計算機嗎? 有/沒有

6.

The velocity of a body moving in a straight line  $t$  seconds after starting from rest is  $(4t^3 - 12t^2)$  meters per second. How many seconds after starting does its acceleration become zero?

- A 1
- B 2
- C 3
- D 4
- E 6

Calculator used? Yes / No

6.

一物體作直線運動。由靜止開始,經  $t$  秒後它的速度是每秒  $(4t^3 - 12t^2)$  米。問開始運動後若干秒,它的加速度是零?

- A 1
- B 2
- C 3
- D 4
- E 6

有用計算機嗎? 有/沒有

7.

A certain number of students are to be accommodated in a hostel. If two students share each room, then two students will be left without any room. If three students share each room, then two rooms will be left unoccupied. How many rooms are there in the hostel?

- A 6  
B 8  
C 10  
D 12  
E 14

Calculator used? Yes / No

7.

一群學生將居住於一宿舍。若每房間容納兩學生，則有兩學生沒有房間分配。若每房間容納三學生，則有兩房間沒有學生居住。問該宿舍有多少房間？

- A 6  
B 8  
C 10  
D 12  
E 14

有用計算機嗎？ 有/沒有

8.

The value of

$$\lim_{h \rightarrow 0} \frac{\sqrt{2+h} - \sqrt{2}}{h} \text{ is}$$

- A 0  
B  $\frac{1}{2\sqrt{2}}$   
C  $\frac{1}{2}$   
D  $\frac{1}{\sqrt{2}}$   
E  $\infty$

Calculator used? Yes / No

8.

$$\lim_{h \rightarrow 0} \frac{\sqrt{2+h} - \sqrt{2}}{h} \text{ 的值是}$$

- A 0  
B  $\frac{1}{2\sqrt{2}}$   
C  $\frac{1}{2}$   
D  $\frac{1}{\sqrt{2}}$   
E  $\infty$

有用計算機嗎？ 有/沒有

9.

In the Euclidean plane the coordinates of a moving point  $M$  at time  $t$  are

$$x = 2 \sin t$$

$$y = 2 \cos 2t - 1$$

The path of the point  $M$  is

A a line

B a semicircle

C a semiellipse

D a parabola

E a spiral

Calculator used? Yes / No

9.

在歐基里得平面中，一動點  $M$  在時間  $t$  的坐標是

$$x = 2 \sin t$$

$$y = 2 \cos 2t - 1$$

點  $M$  的軌跡是

A 一直線

B 一半圓

C 一半橢圓

D 一拋物線

E 一螺旋

有用計算機嗎？有/沒有

10.

The number of pairs of integer values of  $x, y$  which satisfy

$$x + y \leq 4, x > 0, y > 0$$

simultaneously is

A 3

B 6

C 10

D 14

E 15

Calculator used? Yes / No

10.

有若干對整數值的  $x, y$  能滿足下列聯立不等式

$$x + y \leq 4, x > 0, y > 0$$

A 3

B 6

C 10

D 14

E 15

有用計算機嗎？有/沒有



11.

The curve defined by  $y = x^3 - ax + b$  has a relative minimum point at  $(2, 3)$ . The values of  $a$  and  $b$  are

A  $a = 8\frac{1}{2}$  and  $b = 12$

B  $a = 12$  and  $b = 8\frac{1}{2}$

C  $a = 12$  and  $b = 19$

D  $a = 19$  and  $b = 12$

E  $a = 19$  and  $b = 32$

Calculator used? Yes / No

11.

以  $y = x^3 - ax + b$  為定義的曲線在點  $(2, 3)$  有一相對極小。a 及 b 的值是甚麼？

A  $a = 8\frac{1}{2}$  及  $b = 12$

B  $a = 12$  及  $b = 8\frac{1}{2}$

C  $a = 12$  及  $b = 19$

D  $a = 19$  及  $b = 12$

E  $a = 19$  及  $b = 32$

有用計算機嗎？有 / 沒有

12.

The graph of the curve

$y = \frac{2x + 1}{x^2 + 2x + 3}$  intersects the axes at the points

A  $(\frac{1}{2}, 0)$  and  $(0, -\frac{1}{3})$

B  $(-\frac{1}{3}, 0)$  and  $(0, \frac{1}{2})$

C  $(\frac{1}{2}, 0)$  and  $(0, \frac{1}{3})$

D  $(-\frac{1}{2}, \frac{1}{3})$  and  $(0, 0)$

E  $(-\frac{1}{2}, 0)$  and  $(0, \frac{1}{3})$

Calculator used? Yes / No

12.

曲線  $y = \frac{2x + 1}{x^2 + 2x + 3}$  圖像與兩軸相交於

A  $(\frac{1}{2}, 0)$  及  $(0, -\frac{1}{3})$

B  $(-\frac{1}{3}, 0)$  及  $(0, \frac{1}{2})$

C  $(\frac{1}{2}, 0)$  及  $(0, \frac{1}{3})$

D  $(-\frac{1}{2}, \frac{1}{3})$  及  $(0, 0)$

E  $(-\frac{1}{2}, 0)$  及  $(0, \frac{1}{3})$

有用計算機嗎？有 / 沒有

13.

$l$  is the line determined by the equation  $ax + by = 0$ , and  $m$  is the line determined by the equation  $px + qy + r = 0$ , where  $r \neq 0$ . If  $l$  and  $m$  intersect only at the point  $P$ , and  $O$  is the origin, then  $(a + p)x + (b + q)y + r = 0$  is a line which

- A is mutually perpendicular to  $l$  and  $m$
- B forms an isosceles triangle with  $l$  and  $m$
- C is parallel to  $OP$
- D passes through the origin
- E passes through  $P$

Calculator used? Yes / No

13.

$l$  是方程  $ax + by = 0$  的直線; 而  $m$  是方程  $px + qy + r = 0$  的直線, 其中  $r \neq 0$ . 若  $l$  及  $m$  只交於一點  $P$ , 而  $O$  是原點, 則

$(a + p)x + (b + q)y + r = 0$  是一直線, 而它同時

- A 垂直於  $l$  及  $m$
- B 與  $l$  及  $m$  圍成一等腰三角
- C 與  $OP$  平行
- D 經過原點
- E 經過  $P$

有用計算機嗎? 有/沒有

14.

For which of the following values of  $m$  is the graph of

$$y^2 - 2y + mx^2 + (2m + 1)x = 0$$

a parabola?

- A  $m = -\frac{1}{2}$
- B  $m = 0$
- C all values of  $m$  except  $-\frac{1}{2}$
- D all values of  $m$  except  $0$
- E all values of  $m$  except  $-\frac{1}{2}$  and  $0$

Calculator used? Yes / No

14.

$m$  要取下列何值才可使

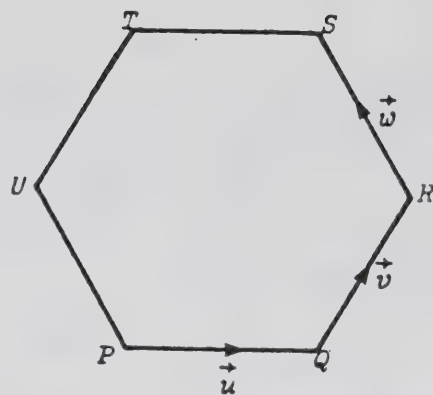
$$y^2 - 2y + mx^2 + (2m + 1)x = 0$$

之圖像為一拋物線?

- A  $m = -\frac{1}{2}$
- B  $m = 0$
- C 除  $-\frac{1}{2}$  外的任何值
- D 除  $0$  外的任何值
- E 除  $-\frac{1}{2}$  及  $0$  外的任何值

有用計算機嗎? 有/沒有

15.

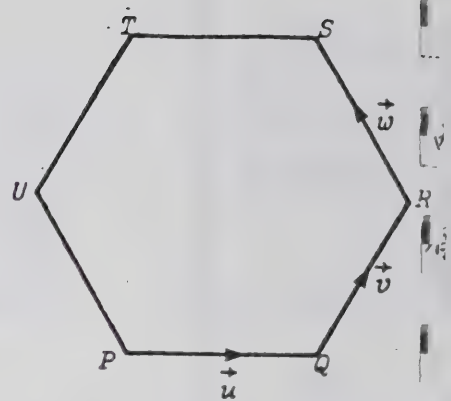


$PQRSTU$  is a regular hexagon in which  $\overrightarrow{PQ}$  represents vector  $\vec{u}$ ,  $\overrightarrow{QR}$  represents vector  $\vec{v}$ , and  $\overrightarrow{RS}$  represents vector  $\vec{w}$ .  $\overrightarrow{PT}$  represents

- A  $2\vec{u} + \vec{v}$
- B  $\vec{u} + \vec{v} + \vec{w}$
- C  $2(\vec{u} + \vec{v} + \vec{w})$
- D  $2\vec{u} + \vec{v} + \vec{w}$
- E  $\vec{v} + \vec{w}$

Calculator used? Yes / No

15.



$PQRSTU$  是一正六角形。  
 $\overrightarrow{PQ}$  表示向量  $\vec{u}$ ,  $\overrightarrow{QR}$  表示向量  $\vec{v}$ ,  
 而  $\overrightarrow{RS}$  表示向量  $\vec{w}$ 。

- $\overrightarrow{PT}$  表示
- A  $2\vec{u} + \vec{v}$
  - B  $\vec{u} + \vec{v} + \vec{w}$
  - C  $2(\vec{u} + \vec{v} + \vec{w})$
  - D  $2\vec{u} + \vec{v} + \vec{w}$
  - E  $\vec{v} + \vec{w}$

有用計算機嗎? 有/沒有

16.

If  $10^a = 4$ , then  $10^{1+2a}$  is equal to

- A 26
- B 40
- C 160
- D 900
- E  $10^9$

Calculator used? Yes / No

16. 若  $10^a = 4$ , 則  $10^{1+2a}$  等於

- A 26
- B 40
- C 160
- D 900
- E  $10^9$

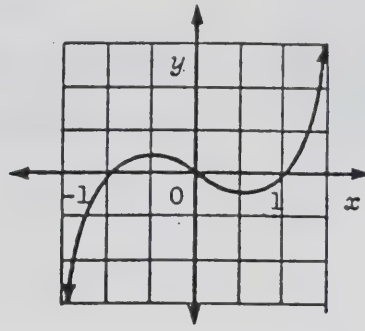
有用計算機嗎? 有/沒有



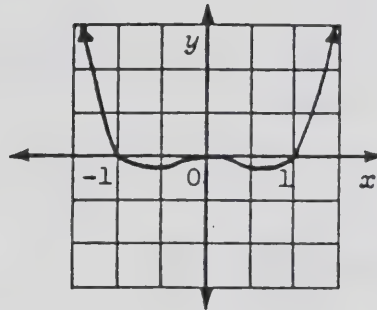
17. Which of the following could be a sketch of the graph of the curve  $y = x^4 - x^2$ ?

下列那一幅簡圖會是  
曲线  $y = x^4 - x^2$  的圖像

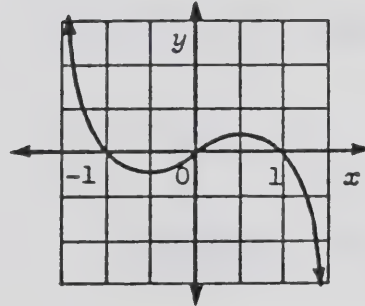
A



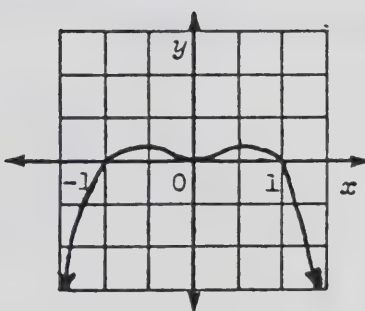
B



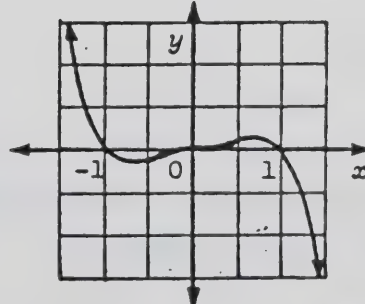
C



D



E



Calculator used? Yes / No - END - 有用計算機嗎? 有/沒有



INTERNATIONAL ASSOCIATION for the  
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BOOKLET 15

COGNITIVE TEST

SIXTH FORMS

time: 55 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81

# INSTRUCTIONS FOR STUDENTS

1. This is a test on different topics in mathematics. Since it is an international test, you may find some questions which are not familiar to you. You should not be discouraged by this. Please go on to other questions which are more **familiar**. Then, if you have time later, you may come back to questions which you left out.
2. Please use a SOFT HB pencil throughout the whole test.
3. Fill in ALL your particulars on the top of the answer sheet provided.
4. The following example will help you to answer the individual questions.

## EXAMPLE

27 - 19 is equal to

- A 8
- B 12
- C 16
- D 18
- E None of these

The correct answer is given by option A.

Suppose you have used a calculator in answering the question, then you should fill in the spaces like this:

Calculator used?	Yes	No
	<input checked="" type="checkbox"/>	<input type="checkbox"/>

 有使用計算機嗎？有 沒有

# 學生須知

1. 這個數學測驗廣泛涉及很多不同種類的问题。因為這測驗是國際性的，所以你會對某些問題不大熟悉。你不須因此而感覺憂慮。你可先答其它你較為熟悉的问题。然後，如果你有時間，你可以再答你留空了的问题。
2. 在整個測驗中，請用‘粗’的HB鉛筆作答。
3. 在答案紙的頂端，請填上所有必須的資料。
4. 下列的例題會幫助你回答測驗中的問題。

## 例

27 - 19 等於

- A 8
- B 12
- C 16
- D 18
- E 以上都不是

正確的答案是 A。

假如你用了計算機作答，你須將答案空格如下填上：

Calculator used?	Yes	No
	<input type="checkbox"/>	<input checked="" type="checkbox"/>

 有使用計算機嗎？有 沒有



1.

If  $\log N = n$ , then  
 $\log N^2$  is equal to

A  $n + 2$

B  $n^2$

C  $\frac{n}{2}$

D  $2n$

E  $n - 2$

Calculator used? Yes / No

1.

若  $\log N = n$ , 則  
 $\log N^2$  等於

A  $n + 2$

B  $n^2$

C  $\frac{n}{2}$

D  $2n$

E  $n - 2$

有用計算機嗎? 有/沒有

2.

A test is taken by all first year university students in a country. The mean is 50 and the standard deviation 20. Assuming the scores are normally distributed, approximately what percentage of students score more than 30?

A 95%

B 84%

C 68%

D 32%

E 16%

Calculator used? Yes / No

2.

某國家所有大學一年級的學生都參加一項測驗。測驗的平均分是 50, 標準差是 20. 假設績分是以常態分佈, 問大約有百分之幾的學生的分數是高於 30 的?

A 95%

B 84%

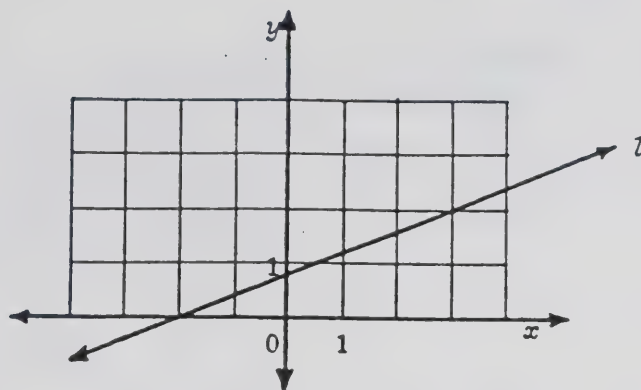
C 68%

D 32%

E 16%

有用計算機嗎? 有/沒有

3.



The line  $l$  in the figure is the graph of  $y = f(x)$ .

$\int_{-2}^3 f(x) dx$  is equal to

- A 3
- B 4
- C 4.5
- D 5
- E 5.5

Calculator used? Yes / No

上圖中， $l$  線是  $y = f(x)$  的圖像。  
 $\int_{-2}^3 f(x) dx$  等於

- A 3
- B 4
- C 4.5
- D 5
- E 5.5

有用計算機嗎？有 / 沒有

4.

$$P(n) = \frac{n^3 - 2n^2 - n + 2}{n^2 - 1}$$

$P(n)$  is not defined for

- A  $n = 1$  and  $n = 2$
- B  $n = -1$  and  $n = 2$
- C  $n = -1$  and  $n = 1$
- D  $n = -2$  and  $n = 1$
- E  $n = -2$  and  $n = -1$

Calculator used? Yes / No

4.

$$P(n) = \frac{n^3 - 2n^2 - n + 2}{n^2 - 1}$$

$P(n)$  在下列那些  $n$  值中無定

- A  $n = 1$  and  $n = 2$
- B  $n = -1$  and  $n = 2$
- C  $n = -1$  and  $n = 1$
- D  $n = -2$  and  $n = 1$
- E  $n = -2$  and  $n = -1$

有用計算機嗎？有 / 沒有

5.

Consider the subspaces of the vector space  $\mathbb{R}^3$

$$\begin{aligned} E_1 \text{ spanned by } \vec{e}_1 &= (1, -1, 2) \\ \vec{e}_2 &= (1, 1, 2) \\ \vec{e}_3 &= (3, -1, 6) \end{aligned}$$

$$\begin{aligned} E_2 \text{ spanned by } \vec{e}'_1 &= (0, -2, 0) \\ \vec{e}'_2 &= (1, 0, 1) \end{aligned}$$

What is the subspace  $E_1 \cap E_2$ ?

- A  $\emptyset$
- B  $\{\vec{0}\}$
- C  $E_2$
- D the space  $E$  spanned by  $\vec{e}_1$
- E the space  $E$  spanned by  $\vec{e}_2$

Calculator used? Yes / No

6.

The area enclosed between the curve  $y = 2x^3 - 6x^2 + 3$  and the line  $y = 2x - 3$  is

- A -16
- B -8
- C 0
- D 8
- E 16

Calculator used? Yes / No

5.

$E_1$  及  $E_2$  是向量空間  $\mathbb{R}^3$  的子空間。

$$\begin{aligned} E_1 \text{ 是由 } \vec{e}_1 &= (1, -1, 2), \\ \vec{e}_2 &= (1, 1, 2), \\ \text{及 } \vec{e}_3 &= (3, -1, 6) \text{ 所構成,} \end{aligned}$$

$$\begin{aligned} E_2 \text{ 是由 } \vec{e}'_1 &= (0, -2, 0), \\ \text{及 } \vec{e}'_2 &= (1, 0, 1) \text{ 所構成.} \end{aligned}$$

問子空間  $E_1 \cap E_2$  為何?

- A  $\emptyset$
- B  $\{\vec{0}\}$
- C  $E_2$
- D 由  $\vec{e}_1$  構成的空間  $E$
- E 由  $\vec{e}_2$  構成的空間  $E$

有用計算機嗎? 有/沒有

6. 曲綫  $y = 2x^3 - 6x^2 + 3$  及直綫  $y = 2x - 3$  所包的面積是

- A -16
- B -8
- C 0
- D 8
- E 16

有用計算機嗎? 有/沒有



7.

A number is the multiplicative inverse of another number if the product of the two numbers is 1. Which of the following sets of numbers is identical to the set of its multiplicative inverses?

A  $\{1, 2, 3\}$

B  $\{1, \frac{1}{2}\}$

C  $\{1, 2, \frac{1}{2}\}$

D  $\{2, 3, 5, \frac{1}{2}, \frac{1}{3}\}$

E  $\{2, 3, \frac{2}{3}\}$

Calculator used? Yes / No

7.

若兩數的積是 1, 那麼一數是另一數的乘法倒數。下列一集與其元素的乘法倒數相同?

A  $\{1, 2, 3\}$

B  $\{1, \frac{1}{2}\}$

C  $\{1, 2, \frac{1}{2}\}$

D  $\{2, 3, 5, \frac{1}{2}, \frac{1}{3}\}$

E  $\{2, 3, \frac{2}{3}\}$

有用計算機嗎? 有/沒

8.

Let a function  $f$  be defined by  $f(x, y) = x$ .  
Let  $G = \{(x, y) \mid f(x, y) = 2\}$ .  
The graph of  $G$  is

A the line  $x = 2$

B the line  $x + y = 2$

C the line  $x = y$

D the  $x$ -axis

E the  $y$ -axis

Calculator used? Yes / No

8.

函數  $f$  的定義是  $f(x, y) = x$ .  
設  $G = \{(x, y) \mid f(x, y) = 2\}$ .  
 $G$  的圖像是

A 直線  $x = 2$

B 直線  $x + y = 2$

C 直線  $x = y$

D  $x$  軸

E  $y$  軸

有用計算機嗎? 有/沒

9.

A stationer wants to make a card 8 cm long and of such a width that when the card is cut into halves, the original width becomes the length and the shape of each half is similar to the original card. What width, in centimeters, should he make the original card?

A 4

B  $4\sqrt{2}$ C  $5\sqrt{2}$ D  $5\sqrt{3}$ 

E 6

Calculator used? Yes / No

9.

一文具商欲製造一種 8 cm 長的咭片, 它的闊度需適合下列條件: 當咭紙切成兩等份後, 每一份的長度是原來咭紙的闊度, 且每一份均與原來的咭紙相似。問那咭紙的闊度應該多少 cm?

A 4

B  $4\sqrt{2}$ C  $5\sqrt{2}$ D  $5\sqrt{3}$ 

E 6

有用計算機嗎? 有/沒有

10.

An examination consists of 13 questions. A student must answer only one of the first two questions and only nine of the remaining ones. How many choices of questions does he have?

A  ${}_{13}C_{10} = 286$ B  ${}_{11}C_8 = 165$ C  $2 \times {}_{11}C_9 = 110$ D  $2 \times {}_{11}P_2 = 220$ 

E some other number

Calculator used? Yes / No

10.

一試卷有 13 題, 考生須從第一、二題中祇選答一題, 及從其餘的題目中祇選答九題。問共有多少種選題的方法?

A  ${}_{13}C_{10} = 286$ B  ${}_{11}C_8 = 165$ C  $2 \times {}_{11}C_9 = 110$ D  $2 \times {}_{11}P_2 = 220$ 

E 其它的數目

有用計算機嗎? 有/沒有

11.

Find the difference  $\vec{b} - \vec{a}$  of the vectors  $\vec{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$  and  $\vec{b} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}$ .

A  $\begin{pmatrix} -4 \\ -2 \end{pmatrix}$

B  $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$

C  $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$

D  $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$

E  $\begin{pmatrix} 4 \\ 5 \end{pmatrix}$

Calculator used? Yes / No

11.

向量  $\vec{a} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$  及  $\vec{b} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}$  之差  $\vec{b} - \vec{a}$  是

A  $\begin{pmatrix} -4 \\ -2 \end{pmatrix}$

B  $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$

C  $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$

D  $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$

E  $\begin{pmatrix} 4 \\ 5 \end{pmatrix}$

有用計算機嗎? 有/沒

12.

The functions  $f$  and  $g$  are defined by  $f(x) = x - 1$  and  $g(x) = (x + 3)^2$

$g(f(x))$  is equal to

A  $(x - 1)(x + 3)^2$

B  $(x + 3)^2 - 1$

C  $(2x - 2)^2$

D  $(x + 2)^2$

E  $x^2 + 8$

Calculator used? Yes / No

12.

函數  $f$  及  $g$  的定義分別是  $f(x) = x - 1$  及  $g(x) = (x + 3)^2$

$g(f(x))$  等於

A  $(x - 1)(x + 3)^2$

B  $(x + 3)^2 - 1$

C  $(2x - 2)^2$

D  $(x + 2)^2$

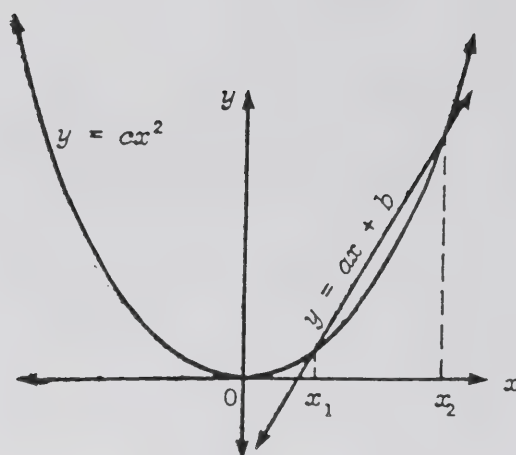
E  $x^2 + 8$

有用計算機嗎? 有/沒有



13.

$\vec{b} = \begin{pmatrix} 0 \\ 3 \end{pmatrix}$  之差



According to the graph,

$$ax + b > cx^2 \quad \text{when}$$

- A  $(x - x_1)(x - x_2) > 0$
- B  $(x - x_1)(x - x_2) < 0$
- C  $0 < x < x_1$
- D  $x > x_2$
- E None of these

依據上圖,

$$ax + b > cx^2 \quad \text{當}$$

- A  $(x - x_1)(x - x_2) > 0$
- B  $(x - x_1)(x - x_2) < 0$
- C  $0 < x < x_1$
- D  $x > x_2$
- E 以上皆不對

Calculator used? Yes / No

有用計算機嗎? 有/沒有

14.

In any triangle ABC, if  $a$ ,  $b$ , and  $c$  are the lengths of the sides opposite angles A, B, and C respectively, the following relationship is always true:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

If  $b$ ,  $c$ , and  $\angle B$  are given, with  $b < c$  and  $\angle B$  acute, which of the following MUST be true to give unique solutions for  $a$ ,  $m\angle A$ , and  $m\angle C$ ?

- A  $b = c \sin B$
- B  $\frac{\sin A}{\sin B} < 1$
- C  $b \leq a$
- D  $\sin B > \frac{b}{c}$
- E  $b \leq a$  and A is an acute angle

Calculator used? Yes / No

14. 在任意三角形 ABC 中, 若  $a$ ,  $b$  及  $c$  依次表角 A, B, 及 C 對邊的長度, 那麼下列的關係恒真?

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

若給出  $b$ ,  $c$ , 及  $\angle B$ , 且  $b < c$ ,  $\angle B$  為銳角, 問要使  $a$ ,  $m\angle A$ , 及  $m\angle C$  祇有一解, 下列那一項恒真?

- A  $b = c \sin B$
- B  $\frac{\sin A}{\sin B} < 1$
- C  $b \leq a$
- D  $\sin B > \frac{b}{c}$
- E  $b \leq a$  及 A 是銳角

有用計算機嗎? 有/沒有

15.

Given  $\log_b 2 = \frac{1}{3}$ ,  $\log_b 32$  is equal to

A 2

B 5

C  $-\frac{3}{5}$

D  $\frac{5}{3}$

E  $\frac{3}{\log_2 32}$

Calculator used? Yes / No

15.

已知  $\log_b 2 = \frac{1}{3}$ ,  $\log_b 32$  等於

A 2

B 5

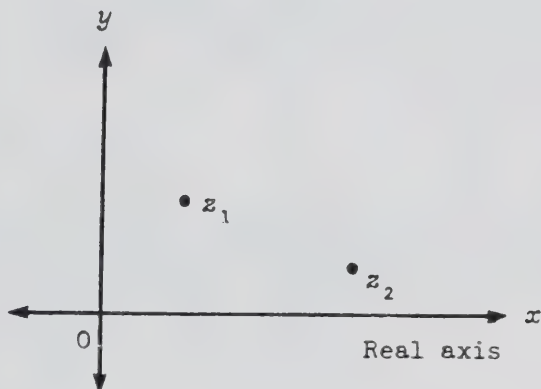
C  $-\frac{3}{5}$

D  $\frac{5}{3}$

E  $\frac{3}{\log_2 32}$

有用計算機嗎? 有/沒有

16.



The complex number  $z = x + iy$  (where  $x$  and  $y$  are real numbers) can be represented by the point  $(x, y)$ . In the diagram,  $z_1$  and  $z_2$  represent two complex numbers. If  $z_3$  is selected such that the origin,  $z_1$ ,  $z_3$  and  $z_2$  are the consecutive vertices of a parallelogram, then  $z_3$  is equal to

A  $z_1 z_2$

B  $\frac{z_1}{z_2}$

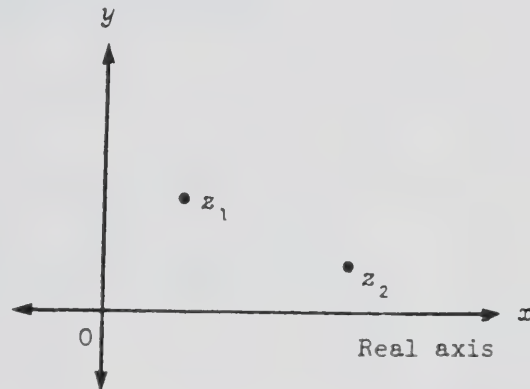
C  $z_1 + z_2$

D  $z_1 - z_2$

E  $\sqrt{z_1^2 + z_2^2}$

Calculator used? Yes / No

16.



複數  $z = x + iy$  (其中  $x$  及  $y$  都是實數) 可用點  $(x, y)$  表示。在圖中  $z_1$  及  $z_2$  表示兩複數。若須選擇  $z_3$ , 使原點、 $z_1$ 、 $z_3$  及  $z_2$  為一平行四邊形順序的四個頂點, 則  $z_3$  等於

A  $z_1 z_2$

B  $\frac{z_1}{z_2}$

C  $z_1 + z_2$

D  $z_1 - z_2$

E  $\sqrt{z_1^2 + z_2^2}$

有用計算機嗎? 有/沒有

17.

Let  $y = 4x^3$ , with  $x$  and  $y$  taking positive real values.  
When  $\log x$  is plotted against  $\log y$ , the resulting graph will be

- A a single point
- B a cubic curve
- C a parabola
- D a straight line
- E an exponential curve

Calculator used? Yes / No

17.

設  $y = 4x^3$ , 其中  $x$  及  $y$  為正實數。若作  $\log x$  對  $\log y$  圖解, 所得的圖像將會是

- A 一點
- B 一條三次曲線
- C 一拋物線
- D 一直線
- E 一指數曲線

有用計算機嗎? 有/沒有

- END -

- 完 -

→  $x$   
axis

B8

都是  
主圖中,  
若須選  
 $z_2$  為  
個頂點,





INTERNATIONAL ASSOCIATION for the  
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## **BOOKLET 1**

### **STUDENT BACKGROUND QUESTIONNAIRE AND AFFECTIVE SCALES**

**FORM 1/MIDDLE 1 classes**  
**ANSWER SHEET (A and B)**  
**time: 30 mins.**

**SECOND STUDY OF MATHEMATICS**  
**HONG KONG 1981**

## INSTRUCTIONS FOR STUDENTS

1. This booklet has 158 questions. Questions 1 to 59 ask for information about you and what you do. Question 60 to 158 seek to find out what you think about mathematics.
2. Please use a SOFT HB pencil to write or mark ALL your answers on the two answer sheets provided.
3. Except for questions 1, 2, 4, and 5, all other questions are multiple choices.
4. Fill in ALL your particulars on the top of BOTH answer sheets.
5. The following provides an example as how questions 1 to 3 may be answered.

EXAMPLE (Typical answers to questions 1 to 3)

1. Father's occupation  
sales man
2. Description of father's work  
He sells clothes  
in Company ABC.
3. 

A	B	C
---	---	---

  
(Refer to the questionnaire. If your mother has no occupation other than housewife, mark A, as shown above.)
6. If you have any difficulty, ask your teacher for help at once.

## 學生須知

1. 這問卷有 158 條問題。  
第 1 至 59 題是關於你及你學習數學的情況。第 60 至 158 題問你對數學的意見。
2. 請將所有答案都用「粗」的 HB 鉛筆填在兩張答案紙上。
3. 除了第 1, 2, 4 及 5 題, 其餘各題都是多項選擇題。
4. 請把你的個人資料在兩張答案紙的上端都小心填上。
5. 下列例子解釋如何答第 1 至 3 題。

例 (第 1 至 3 題的模式答案)

1. 父親職業  
售貨員
2. 父親工作性質及其僱主  
他在 ABC 公司  
推銷服裝。
3. 

A	B	C
---	---	---

  
(請參考問卷第 3 題。  
如你的母親除了是家庭主婦外沒有其它職業, 請如上所示, 在 A 格填上。)
6. 如有任何疑問, 應立即向老師請教。

1. What is or was your father's occupation?  
(If your father is dead or is no longer with your family, give your male guardian's occupation. If you do not have a male guardian, please state what your father's occupation was.)

你父親現在(或過去)的職業是甚麼?  
(如果你父親已去世或與你們分開住,請說出你的男監護人的職業。如果你沒有男監護人,請述你父親最近的職業。)

2. Please describe the work your father does or did and for whom.  
For example, if he is a "salesman", tell what he sells and where he works.

試描述你父親的工作及其僱主。

例如他是“售貨員”,請說出他推銷甚麼商品,及他在何處工作。

3. Does your mother have an occupation other than housewife?  
(If your mother is dead or is no longer with your family, give your female guardian's occupation. If you do not have a female guardian, please state what your mother's occupation was.)

你母親除了是家庭主婦外有沒有其他職業呢?

(如果你的母親已去世或與你們分開住,請說出你的女監護人的職業。如你沒有女監護人,請述你母親最近的職業。)

- A. My mother has no occupation other than housewife.

我的母親除了是家庭主婦外沒有其他職業。

- B. My mother has a part-time occupation other than housewife.

我的母親除了是家庭主婦外有一份兼職。



C. My mother has a full-time occupation other than housewife.  
我的母親除了是家庭主婦外有一份全職。

4. If your mother has an occupation (part-time or full-time), please explain, just as you did for your father, what your mother's occupation is other than housewife.

如果你的母親有一份兼職或全職，請說明她的職業是甚麼，一如你描述你父親的職業一樣。

5. If your mother has an occupation (part-time or full-time) please tell the duties she performs and for whom she works.

如果你的母親有一份兼職或全職，請說明她的職責及她替誰工作。

6. Check the highest type of school or college attended by your father or male guardian.

下列那一項是你父親或男監護人的最高教育程度。

- A. Very little schooling or no schooling at all

很少或完全沒有在學校唸書。

- B. Primary school

小學

- C. Secondary school

中學

- D. College, university or some form of tertiary education

大學或專上學院

7. Check the highest type of school or college attended by your mother or female guardian.

下列那一項是你母親或女監護人的最高教育程度。

- A. Very little schooling or no schooling at all

很少或完全沒有在學校唸書。

- B. Primary school

小學

- C. Secondary school

中學

- D. College, university or some form of tertiary education

大學或專上學院

8. Do your parents speak English at home?

你的父母在家裏有沒有說英語？

- A. They do not speak English at home.

他們沒有用英語談話。

- B. They sometimes speak English at home.

他們間中有用英語談話。

C. They usually speak English at home.

他們經常在家裏用英語談話。

D. They speak only English at home.

他們在家裏祇說英語。

9. Apart from English lessons, what language is used in your school?

除了上英語堂外,你的學校是用甚麼語言授課?

A. Chinese only

祇用中文

B. Mainly Chinese with some English

中文為主,輔以英文

C. Mainly English with some Chinese

英文為主,輔以中文

D. English only

祇用英文

10. After this year, how many more years of full-time (including university, college, etc.) education do you expect or plan to complete?

今年之後,你繼續或打算再要接受多少年正式教育(包括大學,專上學院,或其它)?

A. None at all

不再求學

B. Up to 2 years

2年

C. More than 2 years - up to 5 years

2年至5年

D. More than 5 years - up to 8 years

5年至8年

E. More than 8 years

超過8年

11. About how many hours of homework in mathematics, outside of formal class time, did you do last week?

上星期除了正式上課外,你共用了多少時間做數學家課?

A. Less than 1 hour

少過1小時

B. 1 to 3 hours

1至3小時

C. 3 to 5 hours

3至5小時

D. 5 to 7 hours

5至7小時

E. More than 7 hours

超過7小時

12. About how many hours of homework in mathematics, outside of formal class time, have you been doing in a typical week?  
通常一星期裏,除了正式上課之外,你共用了多少時間做數學家課?
- A. Less than 1 hour  
少過 1 小時
  - B. 1 to 3 hours  
1 至 3 小時
  - C. 3 to 5 hours  
3 至 5 小時
  - D. 5 to 7 hours  
5 至 7 小時
  - E. More than 7 hours  
超過 7 小時
13. About how many hours of homework for all subjects, outside of formal class time, did you do last week?  
上星期除了正式上課時間外,你共用了多少時間做各科的家課?
- A. Less than 2 hours  
少過 2 小時
  - B. 2 to 6 hours  
2 至 6 小時
  - C. 6 to 10 hours  
6 至 10 小時
  - D. 10 to 15 hours  
10 至 15 小時
  - E. More than 15 hours  
超過 15 小時
14. About how many hours of homework for all subjects, outside of formal class time, have you been doing in a typical week?  
通常一星期裏,除了正式上課時間之外,你共用了多少時間做各科的家課?
- A. Less than 2 hours  
少過 2 小時
  - B. 2 to 6 hours  
2 至 6 小時
  - C. 6 to 10 hours  
6 至 10 小時
  - D. 10 to 15 hours  
10 至 15 小時
  - E. More than 15 hours  
超過 15 小時



15. How many extra mathematics tutoring or instruction did you receive outside of your school last week?

上星期你在學校以外接受了多少額外的數學補習或指導?

- A. 0 hour  
沒有
- B. 1 hour  
1 小時
- C. 2 hours  
2 小時
- D. 3 to 4 hours  
3 至 4 小時
- E. More than 4 hours  
超過 4 小時

16. How many extra mathematics tutoring or instruction have you been receiving outside of your school in a typical week?

通常一星期裏你在學校以外接受了多少額外的數學補習或指導?

- A. 0 hour  
沒有
- B. 1 hour  
1 小時
- C. 2 hour  
2 小時
- D. 3 to 4 hours  
3 至 4 小時
- E. More than 4 hours  
超過 4 小時

17. So far this year how frequently has any member of your family helped you with your mathematics?

今年內直至目前,在數學科上,你的家人給予你的指導是否頻密?

- A. Never or very infrequently  
完全沒有或非常少
- B. Occasionally  
間中有指導
- C. Regularly  
經常指導

18 - 20. About abacus

關於算盤

18. Do you use it at home? 你在家裏有沒有使用算盤? A. Yes 有 B. No 沒有
19. Do you use it in mathematics class? 你在數學堂有沒有使用算盤? A. Yes 有 B. No 沒有
20. Do you use it in other class? 你在其他課堂有沒有使用算盤? A. Yes 有 B. No 沒有

21 - 23. About slide rule

關於計算尺

21. Do you use it at home? 你在家裏有沒有使用計算尺? A. Yes 有 B. No 沒有
22. Do you use it in mathematics class? 你在數學堂有沒有使用計算尺? A. Yes 有 B. No 沒有
23. Do you use it in other class? 你在其他課堂有沒有使用計算尺? A. Yes 有 B. No 沒有

24 - 26. About four-function calculator

關於四則運算計算機

24. Do you use it at home? 你在家裏有沒有使用上述計算機? A. Yes 有 B. No 沒有
25. Do you use it in Mathematics class? 你在數學堂有沒有使用上述計算機? A. Yes 有 B. No 沒有
26. Do you use it in other class? 你在其他課堂有沒有使用上述計算機? A. Yes 有 B. No 沒有

27 - 29. About 'scientific' (i.e. pre-programmed multi-function) calculator or 'programmable' calculator

關於'科學'(即預先編訂程序多種功能)或'可編程序'的計算機。

27. Do you use it at home? 你在家裏有沒有使用上述計算機? A. Yes 有 B. No 沒有
28. Do you use it in mathematics class? 你在數學堂有沒有使用上述計算機? A. Yes 有 B. No 沒有
29. Do you use it in other class? 你在其他課堂有沒有使用上述計算機? A. Yes 有 B. No 沒有

30 - 32. About personal computer or computer terminal

關於私人電腦或電腦中心

30. Do you use it at home? 你在家裏有沒有使用上述設備? A. Yes 有 B. No 沒有
31. Do you use it in mathematics class? 你在數學堂有沒有使用上述設備? A. Yes 有 B. No 沒有
32. Do you use it in other class? 你在其他課堂有沒有使用上述設備? A. Yes 有 B. No 沒有

33. Do you use a four function calculator in school purely for CHECKING answers? A. Yes B. No  
你在學校裏使用四則運算計算機是否純粹為了核對答案? 是 否
34. Do you use a scientific or programmable calculator in school purely for CHECKING answer? A. Yes B. No  
你在學校裏使用'科學'可編程序的計算機是否純粹為了核對答案? 是 否
35. Do you use a computer or a terminal in school purely for CHECKING answers? A. Yes B. No  
你在學校裏使用電腦或電腦中心是否純粹為了核對答案? 是 否
36. Do you use a four function calculator in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用四則運算計算機作為解決問題的輔助工具? 是 否
37. Do you use a scientific or programmable calculator in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用'科學'或可編程序的計算機作為解決問題的輔助工具? 是 否
38. Do you use a computer or a terminal in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用電腦或電腦中心作為解決問題的輔助工具? 是 否
39. Do you use a four function calculator for taking tests? A. Yes B. No  
你有沒有使用四則運算計算機去做測驗題? 有 沒有
40. Do you use a scientific or programmable calculator for taking tests? A. Yes B. No  
你有沒有使用'科學'或可編程序的計算機去做測驗題? 有 沒有
41. Do you use a computer or a terminal for taking tests? A. Yes B. No  
你有沒有使用電腦或電腦中心去做測驗題? 有 沒有
42. Do you use a four function calculator in school as an aid in doing projects? A. Yes B. No  
在學校裏你是否使用四則運算計算機作為數學活動的輔助工具? 是 否
43. Do you use a scientific or programmable calculator in school as an aid in doing projects? A. Yes B. No  
在學校裏你是否使用'科學'或可編程序的計算機作為數學活動的輔助工具? 是 否



44. Do you use a computer or a terminal in school as an aid in doing projects? A. Yes B. No  
 在學校裏你有沒有使用電腦或電腦中心作為數學活動的輔助工具?  
 有 沒有
45. Do you use a four function calculator for recreation? A. Yes B. No  
 你有沒有使用四則運算計算機於娛樂中?  
 有 沒有
46. Do you use a scientific or programmable calculator for recreation? A. Yes B. No  
 你有沒有用「科學」或可編程序的計算機於娛樂中?  
 有 沒有
47. Do you use a computer or a terminal for recreation? A. Yes B. No  
 你有沒有使用電腦或電腦中心於娛樂中?  
 有 沒有
48. Do you use a four function calculator at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用四則運算計算機去做家課?  
 有 沒有
49. Do you use a scientific or programmable calculator at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用「科學」或可編程序的計算機去做家課?  
 有 沒有
50. Do you use a computer or a terminal at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用電腦或電腦中心去做家課?  
 有 沒有

Items 51 to 59 are some statements about you, your mother or father (or both) and mathematics. You are asked to mark each statement in terms of how well it describes what your parent does or thinks about mathematics.

第51題至59題是關於你和你的母親或父親(或兩者)及數學的,請在每題中選出一項最恰當描述你家長對數學的想法及做法,加以標記。

51. My father seems to enjoy doing mathematics.  
 我的父親似乎很喜愛做數學的問題。  
 A. Exactly like B. Somewhat like C. Unsure D. Not very much like E. Not at all like  
 確實喜愛 有些喜愛 不肯定 不甚喜愛 全不喜愛
52. My mother seems to like doing mathematics.  
 我的母親似乎喜歡做數學的問題。  
 A. Exactly like B. Somewhat like C. Unsure D. Not very much like E. Not at all like  
 確實喜愛 有些喜愛 不肯定 不甚喜愛 全不喜愛

53. My father would usually be able to do my mathematics homework problems if I asked him to help.

若我問父親有關數學科的功課問題，通常他都可以解答。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實可以	略可以	不肯定	多數不能	完全不能

54. My mother would usually be able to do my mathematics homework problems if I asked her to help.

若我問母親有關數學科的功課問題，通常她都可以解答。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實可以	略可以	不肯定	多數不能	完全不能

55. My parents are not usually very interested in helping me with mathematics.

通常我的父母都不大喜歡替我解答數學問題。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

56. My mother thinks that learning mathematics is very important for me.

我的母親認為學習數學對我是非常重要的。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

57. My father thinks that learning mathematics is very important for me.

我的父親認為學習數學對我是非常重要的。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

58. My parents encourage me to learn as much mathematics as possible.

我的父母鼓勵我盡力學習更多數學。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

59. My parents want me to do very well in mathematics class.

我的父母要我在數學課上做得非常好。

- |                            |                             |                          |                                  |                               |
|----------------------------|-----------------------------|--------------------------|----------------------------------|-------------------------------|
| A. Exactly<br>like<br>確實如此 | B. Somewhat<br>like<br>稍稍如是 | C. Unsure<br>like<br>不肯定 | D. Not very<br>much like<br>多數不是 | E. Not at<br>all like<br>完全不是 |
|----------------------------|-----------------------------|--------------------------|----------------------------------|-------------------------------|

In questions 60 to 104, you are given a list of things you do or learn about in mathematics. For each of the activities you are asked to state how important they are, how difficult you find them and how much you like them. Mark the choice which best describes your feeling.

第60至104題提供了在數學中你會做的或學習的種種事物。對於每一活動你需要指出它們是怎樣重要，怎樣困難及你對它們的喜愛程度，請選出一項最適合描述你的感受然後加以標記。

- 60 - 62. How do you feel about:

checking an answer to a problem  
by going back over it?

你對於重覆地核對一個問題的答案的感受如何？

- |     |                              |                    |                      |                            |                                    |
|-----|------------------------------|--------------------|----------------------|----------------------------|------------------------------------|
| 60. | A. very<br>important<br>非常重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not<br>important<br>不重要 | E. not at all<br>important<br>絕不重要 |
|-----|------------------------------|--------------------|----------------------|----------------------------|------------------------------------|

- |     |                      |               |                      |               |                      |
|-----|----------------------|---------------|----------------------|---------------|----------------------|
| 61. | A. very easy<br>非常容易 | B. easy<br>容易 | C. undecided<br>未能決定 | D. hard<br>困難 | E. very hard<br>非常困難 |
|-----|----------------------|---------------|----------------------|---------------|----------------------|

- |     |                          |               |                      |                   |                             |
|-----|--------------------------|---------------|----------------------|-------------------|-----------------------------|
| 62. | A. like<br>a lot<br>十分喜歡 | B. like<br>喜歡 | C. undecided<br>未能決定 | D. dislike<br>不喜歡 | E. dislike<br>a lot<br>很不喜歡 |
|-----|--------------------------|---------------|----------------------|-------------------|-----------------------------|

- 63 - 65. How do you feel about:

memorizing rules and formulae?

你對於牢記規則及公式覺得怎樣？

- |     |                              |                    |                      |                            |                                    |
|-----|------------------------------|--------------------|----------------------|----------------------------|------------------------------------|
| 63. | A. very<br>important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not<br>important<br>不重要 | E. not at all<br>important<br>絕不重要 |
|-----|------------------------------|--------------------|----------------------|----------------------------|------------------------------------|

- |     |                      |               |                      |               |                      |
|-----|----------------------|---------------|----------------------|---------------|----------------------|
| 64. | A. very easy<br>十分容易 | B. easy<br>容易 | C. undecided<br>未能決定 | D. hard<br>困難 | E. very hard<br>十分困難 |
|-----|----------------------|---------------|----------------------|---------------|----------------------|

- |     |                          |               |                      |                   |                             |
|-----|--------------------------|---------------|----------------------|-------------------|-----------------------------|
| 65. | A. like<br>a lot<br>十分喜歡 | B. like<br>喜歡 | C. undecided<br>未能決定 | D. dislike<br>不喜歡 | E. dislike<br>a lot<br>很不喜歡 |
|-----|--------------------------|---------------|----------------------|-------------------|-----------------------------|



66 - 68. How do you feel about:

Using charts and graphs?

你對於圖表運用的感受如何?

66. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
67. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
68. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

69 - 71. How do you feel about:

Solving word problems?

你對於解答文字題的感受如何?

69. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
70. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
71. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

72 - 74. How do you feel about:

Solving questions?

你對於解答問題的感受如何?

72. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
73. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
74. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

75 - 77. How do you feel about:

Solving inequalities?

你對於解不等式的感受如何?

75. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
76. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
77. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

78 - 80. How do you feel about:

Learning about geometric figures?

你對於學習幾何圖形的感受如何?

78. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
79. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
80. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

81 - 83. How do you feel about:

Estimating answers to problems?

你對於估計問題答案的感受如何?

81. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
82. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
83. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

84 - 86. How do you feel about:

Learning about ratio and proportion?

你對於學習比率及比例的感受如何?

84. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
85. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難

86. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

87 - 89. How do you feel about:

Working problems that involve decimal fractions?

你對於做有小數點的問題的感受如何?

87. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要

88. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難

89. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

90 - 92. How do you feel about:

Working with sets?

你對於解「集」的數學問題的感受如何?

90. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要

91. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難

92. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

93 - 95. How do you feel about:

Learning about units of measure (e.g., distance, area, volume)?

你對於學習度量的單位 (例如: 距離, 面積及體積) 的感受如何?

93. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要

94. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難

95. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡



96 - 98. How do you feel about:

Drawing geometric figures?

你對於繪畫幾何圖形的感受如何？

- |     |                           |                    |                      |                         |                                 |
|-----|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 96. | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 97. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 98. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

99 - 101. How do you feel about:

Getting information from statistical tables?

你對於從統計表中找資料的感受如何？

- |      |                           |                    |                      |                         |                                 |
|------|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 99.  | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 100. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 101. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

102 - 104. How do you feel about:

Comparing geometric figures that are similar?

你對於比較相似的幾何圖形的感受如何？

- |      |                           |                    |                      |                         |                                 |
|------|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 102. | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 103. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 104. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

Express, on a five point scale, the extent of your agreement between the feeling expressed in each of the following statements and your own personal feelings. Mark the choice which best describes your feelings.

用一個五點標度來表達你對下列各項問題的感受。  
把你所選擇的加以標記。

105. Mathematics will change rapidly in the near future.  
在最近的將來數學會演變得很快速。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
106. Mathematics is a good field for creative people.  
對於有創造力的人，數學是一個好的研究範疇。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
107. There is little place for originality in solving mathematics problems.  
很難有創新性的方法去解答數學問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
108. New discoveries in mathematics are constantly being made.  
數學上不斷有新發現。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
109. Mathematics helps one to think according to strict rules.  
數學有助人根據嚴謹的規律去思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
110. Estimating is an important mathematics skill.  
「估計」是一項重要的數學技巧。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
111. There are many different ways to solve most mathematics problems.  
大多數的數學問題都可用多種不同的方法去解答。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

112. Learning mathematics involves mostly memorizing.  
學習數學大部份是靠記憶的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
113. In mathematics, problems can be solved without using rules.  
在數學上, 不利用規則也可以解決問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
114. Trial and error can often be used to solve a mathematics problem.  
數學上的問題通常可以通過不斷摸索的途徑來解決。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
115. There is always a rule to follow in solving a mathematics problem.  
解答一個數學問題, 總可以依著一些規則作為根據。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
116. There have probably not been any new discoveries in mathematics for a long time.  
大概有一段頗長的時間沒有甚麼數學上的新發現了。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
117. Mathematics is a set of rules.  
數學是一組規則。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
118. A mathematics problem can always be solved in different ways.  
一個數學問題時常都能由不同的方法解答。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
119. Mathematics helps one to think logically.  
數學可助人邏輯地思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
120. I really want to do well in mathematics.  
我真的很想把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



121. My parents really want me to do well in mathematics.  
我的父母真的想我把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
122. I am looking forward to taking more mathematics.  
我期望學習更多數學。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
123. I feel good when I solve a mathematics problem by myself.  
當我能親自解答一個數學問題時我覺得很欣慰。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
124. I usually understand what we are talking about in mathematics class.  
在數學堂中我通常都能明白在討論的事情。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
125. I am not so good at mathematics.  
我的數學並不太好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
126. I like to help others with mathematics problems.  
我樂於助人解答數學上的問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
127. If I had my choice I would not learn any more mathematics.  
如果我可選擇，我便不會學更多的數學了。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
128. I feel challenged when I am given a difficult mathematics problem.  
我覺得面對一個數學難題如同接受一項挑戰。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

129. I refuse to spend a lot of my own time doing mathematics.  
我拒絕花太多時間在數學方面。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
130. Mathematics is harder for me than for most persons.  
與多數人比較，數學對於我來說是較為困難的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
131. I could never be a good mathematician.  
我永遠不會成為一個優秀的數學家。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
132. No matter how hard I try I still do not do well in mathematics.  
無論我怎樣努力我仍然不能把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
133. I will work a long time in order to understand a new idea in mathematics.  
我會用一段很長的時間去瞭解一個新的數學概念。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
134. Working with numbers makes me happy.  
運算數字使我感到快樂。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
135. It scares me to have to take mathematics.  
規定要選修數學會令我感到恐懼。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
136. I usually feel calm when doing mathematics problems.  
做數學問題時，我通常都是鎮定的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



137. I think mathematics is fun.  
我認為數學是有趣的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
138. When I cannot figure out a problem, I feel as though I am lost in a maze of words and cannot find my way out.  
當我不能理解一個問題時，我會覺得好像是迷失於一個文字的迷宮裏而不能找到出路。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
139. Men make better scientists and engineers than women.  
男人做科學家和工程師總比女人好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
140. Boys have more natural ability in mathematics than girls.  
男孩子在數學上的天份比女孩子高。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
141. Boys need to know more mathematics than girls.  
在數學方面，男孩子需要比女孩子知道更多。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
142. A woman needs a career just as much as a man does.  
在事業方面，女人一如男人，有同樣的需要。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
143. It is important to know arithmetic to get a good job.  
要獲得一份好的工作，懂得算術是重要的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
144. Most people do not use arithmetic in their jobs.  
大多數人在工作上都用不到算術。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



145. I would like to work at a job that lets me use mathematics.  
我喜歡做一份可讓我運用數學的工作。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
146. Mathematics is useful in solving everyday problems.  
數學對解決日常問題是有用的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
147. I can get along well in everyday life without using mathematics.  
不用數學我也能夠生活得很好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
148. Most of mathematics has practical use on the job.  
大部份的數學對工作都有實際的用途。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
149. Mathematics is not needed in everyday living.  
在日常生活中是用不着數學的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
150. A knowledge of mathematics is not necessary in most occupations.  
在大多數行業中數學的知識是不需要的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
151. Computers can think.  
電腦能夠思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
152. Someday computers will run everything.  
总有一天電腦能夠管理一切事務。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

153. Computers make learning mathematics more enjoyable.  
電腦令人學習數學更愉快。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意
154. Everyone should learn about computers.  
每一個人都應該學用電腦。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意
155. Using a hand calculator makes it more fun to solve problems in mathematics.  
用手提計算機能增添解答數學問題的樂趣。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意
156. Mathematical ideas can be learned faster if you use a hand calculator.  
用手提計算機可助你把數學概念學習得更快。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意
157. If you use a hand calculator you do not have to learn how to compute.  
用手提計算機,你便毋須要學習如何運算。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意
158. Using a hand calculator can help you learn many different mathematical topics.  
用手提計算機可助你學習更多不同的數學課題。
- A. Strongly Disagree   B. Disagree   C. Undecided   D. Agree   E. Strongly Agree  
十分反對   不同意   未能決定   同意   非常同意



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

## BOOKLET 7

STUDENT BACKGROUND QUESTIONNAIRE  
AND AFFECTIVE SCALES

SIX<sup>TH</sup> FORMS  
ANSWER SHEET (A and B)  
time: 30 mins.

SECOND STUDY OF MATHEMATICS  
HONG KONG 1981



## INSTRUCTIONS FOR STUDENTS

1. This booklet has 158 questions. Questions 1 to 59 ask for information about you and what you do. Question 60 to 158 seek to find out what you think about mathematics.
2. Please use a **SOFT** HB pencil to write or mark **ALL** your answers on the two answer sheets provided.
3. Except for questions 1, 2, 4, and 5, all other questions are multiple choices.
4. Fill in **ALL** your particulars on the top of **BOTH** answer sheets.
5. The following provides an example as how questions 1 to 5 may be answered.

EXAMPLE (Typical answers to questions 1 to 5)

1. Father's occupation

salesman

2. Description of father's work

He sells clothes

in Company ABC.

3. A B C

(Refer to the questionnaire.  
If your mother has no occupation other than housewife, mark A, as shown above.)

6. If you have any difficulty, ask your teacher for help at once.

## 學生須知

1. 這問卷有 158 條問題。  
第 1 至 59 題是關於你及你學習數學的情況。第 60 至 158 題是問你對數學的意見。
2. 請將所有答案都用「粗」的 HB 鉛筆填在兩張答案紙上。
3. 除了第 1, 2, 4 及 5 題, 其餘各題都是多項選擇題。
4. 請把你的個人資料在兩張答案紙的上端都小心填上。
5. 下列例子解釋如何答第 1 至 3 題。

例 (第 1 至 3 題的模式答案)

父親職業

售貨員

2. 父親工作性質及其僱主

他在 ABC 公司

推銷服裝

3. A B C

(請參考問卷第 3 題。  
如你的母親除了是家庭主婦外沒有其他職業, 請如上所示, 在 A 格填上。)

6. 如有任何疑問, 應立即向老師請教。

1. What is or was your father's occupation?  
(If your father is dead or is no longer with your family, give your male guardian's occupation. If you do not have a male guardian, please state what your father's occupation was.)

你父親現在(或過去)的職業是甚麼?  
(如果你父親已去世或與你們分開住,請說出你的男監護人的職業。如果你沒有男監護人,請述你父親最近的職業。)

2. Please describe the work your father does or did and for whom.  
For example, if he is a "salesman", tell what he sells and where he works.

試描述你父親的工作及其僱主。

例如他是"售貨員",請說出他推銷甚麼商品,及他在何處工作。

3. Does your mother have an occupation other than housewife?  
(If your mother is dead or is no longer with your family, give your female guardian's occupation. If you do not have a female guardian, please state what your mother's occupation was.)

你母親除了是家庭主婦外有沒有其他職業呢?

(如果你的母親已去世或與你們分開住,請說出你的女監護人的職業。如你沒有女監護人,請述你母親最近的職業。)

- A. My mother has no occupation other than housewife.

我的母親除了是家庭主婦外沒有其他職業。

- B. My mother has a part-time occupation other than housewife.

我的母親除了是家庭主婦外有一份兼職。

C. My mother has a full-time occupation other than housewife.

我的母親除了是家庭主婦外有一份全職。

4. If your mother has an occupation (part-time or full-time), please explain, just as you did for your father, what your mother's occupation is other than housewife.

如果你的母親有一份兼職或全職，請說明她的職業是甚麼，一如你描述你父親的職業一樣。

5. If your mother has an occupation (part-time or full-time) please tell the duties she performs and for whom she works.

如果你的母親有一份兼職或全職，請說明她的職責及她替誰工作。

6. Check the highest type of school or college attended by your father or male guardian.

下列那一項是你父親或男監護人的最高教育程度。

- A. Very little schooling or no schooling at all

很少或完全沒有在學校唸書。

- B. Primary school

小學

- C. Secondary school

中學

- D. College, university or some form of tertiary education

大學或專上學院

7. Check the highest type of school or college attended by your mother or female guardian.

下列那一項是你母親或女監護人的最高教育程度。

- A. Very little schooling or no schooling at all

很少或完全沒有在學校唸書。

- B. Primary school

小學

- C. Secondary school

中學

- D. College, university or some form of tertiary education

大學或專上學院

8. Do your parents speak English at home?

你的父母在家裏有沒有說英語？

- A. They do not speak English at home.

他們沒有用英語談話。

- B. They sometimes speak English at home.

他們間中用英語談話。



C. They usually speak English at home.

他們經常在家裏用英語談話。

D. They speak only English at home.

他們在家裏祇說英語。

9. Apart from English lessons, what language is used in your school?

除了英語堂外,你的學校是用甚麼語言授課?

A. Chinese only

祇用中文

B. Mainly Chinese with some English

中文為主,輔以英文

C. Mainly English with some Chinese

英文為主,輔以中文

D. English only

祇用英文

10. After this year, how many more years of full-time (including university, college, etc.) education do you expect or plan to complete?

今年之後,你繼續或打算再要接受多少年正式教育(包括大學,專上學院,或其它)?

A. None at all

不再求學

B. Up to 2 years

2年

C. More than 2 years - up to 5 years

2年至5年

D. More than 5 years - up to 8 years

5年至8年

E. More than 8 years

超過8年

11. About how many hours of homework in mathematics, outside of formal class time, did you do last week?

上星期除了正式上課外,你共用了多少時間做數學家課?

A. Less than 1 hour

少過1小時

B. 1 to 3 hours

1至3小時

C. 3 to 5 hours

3至5小時

D. 5 to 7 hours

5至7小時

E. More than 7 hours

超過7小時

12. About how many hours of homework in mathematics, outside of formal class time, have you been doing in a typical week?

通常一星期裏，除了正式上課之外，你共用了多少時間做數學家課？

A. Less than 1 hour

少過 1 小時

B. 1 to 3 hours

1 至 3 小時

C. 3 to 5 hours

3 至 5 小時

D. 5 to 7 hours

5 至 7 小時

E. More than 7 hours

超過 7 小時

13. About how many hours of homework for all subjects, outside of formal class time, did you do last week?

上星期除了正式上課時間外，你共用了多少時間做各科的家課？

A. Less than 2 hours

少過 2 小時

B. 2 to 6 hours

2 至 6 小時

C. 6 to 10 hours

6 至 10 小時

D. 10 to 15 hours

10 至 15 小時

E. More than 15 hours

超過 15 小時

14. About how many hours of homework for all subjects, outside of formal class time, have you been doing in a typical week?

通常一星期裏，除了正式上課時間之外，你共用了多少時間做各科的家課？

A. Less than 2 hours

少過 2 小時

B. 2 to 6 hours

2 至 6 小時

C. 6 to 10 hours

6 至 10 小時

D. 10 to 15 hours

10 至 15 小時

E. More than 15 hours

超過 15 小時

15. How many extra mathematics tutoring or instruction did you receive outside of your school last week?

上星期你在學校以外接受了多少額外的數學補習或指導?

A. 0 hour

沒有

B. 1 hour

1 小時

C. 2 hours

2 小時

D. 3 to 4 hours

3 至 4 小時

E. More than 4 hours

超過 4 小時

16. How many extra mathematics tutoring or instruction have you been receiving outside of your school in a typical week?

通常一星期裏你在學校以外接受了多少額外的數學補習或指導?

A. 0 hour

沒有

B. 1 hour

1 小時

C. 2 hour

2 小時

D. 3 to 4 hours

3 至 4 小時

E. More than 4 hours

超過 4 小時

17. So far this year how frequently has any member of your family helped you with your mathematics?

今年內直至目前,在數學科上,你的家人給予你的指導是否頻密?

A. Never or very infrequently

完全沒有或非常少

B. Occasionally

間中有指導

C. Regularly

經常指導



18 - 20. About abacus

關於算盤

18. Do you use it at home? A. Yes 有 B. No 沒有  
你在家裏有沒有使用算盤?
19. Do you use it in mathematics class? A. Yes 有 B. No 沒有  
你在數學堂有沒有使用算盤?
20. Do you use it in other class? A. Yes 有 B. No 沒有  
你在其他課堂有沒有使用算盤?

21 - 23. About slide rule

關於計算尺

21. Do you use it at home? A. Yes 有 B. No 沒有  
你在家裏有沒有使用計算尺?
22. Do you use it in mathematics class? A. Yes 有 B. No 沒有  
你在數學堂有沒有使用計算尺?
23. Do you use it in other class? A. Yes 有 B. No 沒有  
你在其他課堂有沒有使用計算尺?

24 - 26. About four-function calculator

關於四則運算計算機

24. Do you use it at home? A. Yes 有 B. No 沒有  
你在家裏有沒有使用上述計算機?
25. Do you use it in Mathematics class? A. Yes 有 B. No 沒有  
你在數學堂有沒有使用上述計算機?
26. Do you use it in other class? A. Yes 有 B. No 沒有  
你在其他課堂有沒有使用上述計算機?

27 - 29. About 'scientific' (i.e. pre-programmed multi-function) calculator or 'programmable' calculator

關於'科學'(即預先編訂程序多種功能)或'可編程序'的計算機。

27. Do you use it at home? A. Yes 有 B. No 沒有  
你在家裏有沒有使用上述計算機?
28. Do you use it in mathematics class? A. Yes 有 B. No 沒有  
你在數學堂有沒有使用上述計算機?
29. Do you use it in other class? A. Yes 有 B. No 沒有  
你在其他課堂有沒有使用上述計算機?

30 - 32. About personal computer or computer terminal

關於私人電腦或電腦中心

30. Do you use it at home? A. Yes 有 B. No 沒有  
你在家裏有沒有使用上述設備?
31. Do you use it in mathematics class? A. Yes 有 B. No 沒有  
你在數學堂有沒有使用上述設備?
32. Do you use it in other class? A. Yes 有 B. No 沒有  
你在其他課堂有沒有使用上述設備?

33. Do you use a four function calculator in school purely for CHECKING answers? A. Yes B. No  
你在學校裏使用四則運算計算機是否純粹為了核對答案? 是 否
34. Do you use a scientific or programmable calculator in school purely for CHECKING answer? A. Yes B. No  
你在學校裏使用'科學'可編程序的計算機是否純粹為了核對答案? 是 否
35. Do you use a computer or a terminal in school purely for CHECKING answers? A. Yes B. No  
你在學校裏使用電腦或電腦中心是否純粹為了核對答案? 是 否
36. Do you use a four function calculator in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用四則運算計算機作為解決問題的輔助工具? 是 否
37. Do you use a scientific or programmable calculator in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用'科學'或可編程序的計算機作為解決問題的輔助工具? 是 否
38. Do you use a computer or a terminal in school as an aid in SOLVING problems? A. Yes B. No  
你在學校裏是否使用電腦或電腦中心作為解決問題的輔助工具? 是 否
39. Do you use a four function calculator for taking tests? A. Yes B. No  
你有沒有使用四則運算計算機去做測驗題? 有 沒有
40. Do you use a scientific or programmable calculator for taking tests? A. Yes B. No  
你有沒有使用'科學'或可編程序的計算機去做測驗題? 有 沒有
41. Do you use a computer or a terminal for taking tests? A. Yes B. No  
你有沒有使用電腦或電腦中心去做測驗題? 有 沒有
42. Do you use a four function calculator in school as an aid in doing projects? A. Yes B. No  
在學校裏你是否使用四則運算計算機作為數學活動的輔助工具? 是 否
43. Do you use a scientific or programmable calculator in school as an aid in doing projects? A. Yes B. No  
在學校裏你是否使用'科學'或可編程序的計算機作為數學活動的輔助工具? 是 否



44. Do you use a computer or a terminal in school as an aid in doing projects? A. Yes B. No  
 在學校裏你有沒有使用電腦或電腦中心作為數學活動的輔助工具? 有 沒有
45. Do you use a four function calculator for recreation? A. Yes B. No  
 你有沒有使用四則運算計算機於娛樂中? 有 沒有
46. Do you use a scientific or programmable calculator for recreation? A. Yes B. No  
 你有沒有用「科學」或可編程序的計算機於娛樂中? 有 沒有
47. Do you use a computer or a terminal for recreation? A. Yes B. No  
 你有沒有使用電腦或電腦中心於娛樂中? 有 沒有
48. Do you use a four function calculator at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用四則運算計算機去做家課? 有 沒有
49. Do you use a scientific or programmable calculator at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用「科學」或可編程序的計算機去做家課? 有 沒有
50. Do you use a computer or a terminal at home to do your homework? A. Yes B. No  
 在家裏你有沒有使用電腦或電腦中心去做家課? 有 沒有

Items 51 to 59 are some statements about you, your mother or father (or both) and mathematics. You are asked to mark each statement in terms of how well it describes what your parent does or thinks about mathematics.

第51題至59題是關於你和你母親或父親(或兩者)及數學的,請在每題中選出一項最恰當描述你家長對數學的想法及做法,以標記。

51. My father seems to enjoy doing mathematics.  
 我的父親似乎很喜愛做數學的問題。  
 A. Exactly like 確實喜愛 B. Somewhat like 有些喜愛 C. Unsure 不肯定 D. Not very much like 不甚喜愛 E. Not at all like 全不喜愛
52. My mother seems to like doing mathematics.  
 我的母親似乎喜歡做數學的問題。  
 A. Exactly like 確實喜愛 B. Somewhat like 有些喜愛 C. Unsure 不肯定 D. Not very much like 不甚喜愛 E. Not at all like 全不喜愛



53. My father would usually be able to do my mathematics homework problems if I asked him to help.

若我問父親有關數學科的功課問題，通常他都可以解答。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實可以	略可以	不肯定	多數不能	完全不能

54. My mother would usually be able to do my mathematics homework problems if I asked her to help.

若我問母親有關數學科的功課問題，通常她都可以解答。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實可以	略可以	不肯定	多數不能	完全不能

55. My parents are not usually very interested in helping me with mathematics.

通常我的父母都不大喜歡替我解答數學問題。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

56. My mother thinks that learning mathematics is very important for me.

我的母親認為學習數學對我是非常重要的。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

57. My father thinks that learning mathematics is very important for me.

我的父親認為學習數學對我是非常重要的。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

58. My parents encourage me to learn as much mathematics as possible.

我的父母鼓勵我盡力學習更多數學。

A. Exactly like	B. Somewhat like	C. Unsure	D. Not very much like	E. Not at all like
確實如此	稍稍如是	不肯定	多數不是	完全不是

59. My parents want me to do very well in mathematics class.

我的父母要我在數學課上做得非常好。

- A. Exactly like 確實如此    B. Somewhat like 稍稍如是    C. Unsure 不肯定    D. Not very much like 多數不是    E. Not at all like 完全不是

In questions 60 to 104, you are given a list of things you do or learn about in mathematics. For each of the activities you are asked to state how important they are, how difficult you find them and how much you like them. Mark the choice which best describes your feeling.

第60至104題提供了在數學中你會做的或學習的種種事物。對於每一活動你需要指出它們是怎樣重要，怎樣困難及你對它們的喜愛程度，請選出一項最適合描述你的感受然後加以標記。

- 60 - 62. How do you feel about:

checking an answer to a problem  
by going back over it?

你對於重覆地校對一個問題的答案的感受如何？

60. A. very important 非常重要    B. important 重要    C. undecided 未能決定    D. not important 不重要    E. not at all important 絕不重要

61. A. very easy 非常容易    B. easy 容易    C. undecided 未能決定    D. hard 困難    E. very hard 非常困難

62. A. like a lot 十分喜歡    B. like 喜歡    C. undecided 未能決定    D. dislike 不喜歡    E. dislike a lot 很不喜歡

- 63 - 65. How do you feel about:

memorizing rules and formulae?

你對於牢記規則及公式覺得怎樣？

63. A. very important 十分重要    B. important 重要    C. undecided 未能決定    D. not important 不重要    E. not at all important 絕不重要

64. A. very easy 十分容易    B. easy 容易    C. undecided 未能決定    D. hard 困難    E. very hard 十分困難

65. A. like a lot 十分喜歡    B. like 喜歡    C. undecided 未能決定    D. dislike 不喜歡    E. dislike a lot 很不喜歡

66 - 68. How do you feel about:  
Solving word problems?

你對於解答文字題的感受如何?

- |     |                           |                    |                      |                         |                                 |
|-----|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 66. | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 67. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 68. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

69 - 71. How do you feel about:  
Getting information from statistical tables?

你對於從統計表中找資料的感受如何?

- |     |                           |                    |                      |                         |                                 |
|-----|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 69. | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 70. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 71. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

72 - 74. How do you feel about:  
Solving questions?

你對於解答問題的感受如何?

- |     |                           |                    |                      |                         |                                 |
|-----|---------------------------|--------------------|----------------------|-------------------------|---------------------------------|
| 72. | A. very important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not important<br>不重要 | E. not at all important<br>絕不重要 |
| 73. | A. very easy<br>十分容易      | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難           | E. very hard<br>十分困難            |
| 74. | A. like a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡       | E. dislike a lot<br>很不喜歡        |

75 - 77. How do you feel about:  
Proving theorems?

你對於證明定理的感受如何?



75. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
76. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
77. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

78 - 80. How do you feel about:  
Using vectors?

你對於運用矢量的感受如何?

78. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
79. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
80. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

81 - 83. How do you feel about:  
Working with complex numbers?

你對於複數的運算的感受如何?

81. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
82. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
83. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

84 - 86. How do you feel about:  
Investigating sequences and series?

你對於研究序列和級數的感受如何?

84. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
85. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難

86. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

87 - 89. How do you feel about:  
Differentiating functions?

你對於求函數的微分的感受如何?

87. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
88. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
89. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

90 - 92. How do you feel about:  
Drawing graphs of functions?

你對於畫函數的圖表的感受如何?

90. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
91. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
92. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

93 - 95. How do you feel about:  
Finding a limit of a function?

你對於求一函數的極限的感受如何?

93. A. very important 十分重要 B. important 重要 C. undecided 未能決定 D. not important 不重要 E. not at all important 絕不重要
94. A. very easy 十分容易 B. easy 容易 C. undecided 未能決定 D. hard 困難 E. very hard 十分困難
95. A. like a lot 十分喜歡 B. like 喜歡 C. undecided 未能決定 D. dislike 不喜歡 E. dislike a lot 很不喜歡

96 - 98. How do you feel about:

Solving systems of linear equations?

你對於解一次方程組的感受如何?

- |     |                              |                     |                      |                            |                                    |
|-----|------------------------------|---------------------|----------------------|----------------------------|------------------------------------|
| 96. | A. very<br>important<br>十分重要 | B. important<br>不重要 | C. undecided<br>未能決定 | D. not<br>important<br>不重要 | E. not at all<br>important<br>絕不重要 |
| 97. | A. very easy<br>十分容易         | B. easy<br>容易       | C. undecided<br>未能決定 | D. hard<br>困難              | E. very hard<br>十分困難               |
| 98. | A. like<br>a lot<br>十分喜歡     | B. like<br>喜歡       | C. undecided<br>未能決定 | D. dislike<br>不喜歡          | E. dislike<br>a lot<br>很不喜歡        |

99 - 101. How do you feel about:

Determining the probability of an outcome?

你對於決定一個實驗結果的或然率的感受如何?

- |      |                              |                     |                      |                            |                                    |
|------|------------------------------|---------------------|----------------------|----------------------------|------------------------------------|
| 99.  | A. very<br>important<br>十分重要 | B. important<br>不重要 | C. undecided<br>未能決定 | D. not<br>important<br>不重要 | E. not at all<br>important<br>絕不重要 |
| 100. | A. very easy<br>十分容易         | B. easy<br>容易       | C. undecided<br>未能決定 | D. hard<br>困難              | E. very hard<br>十分困難               |
| 101. | A. like<br>a lot<br>十分喜歡     | B. like<br>喜歡       | C. undecided<br>未能決定 | D. dislike<br>不喜歡          | E. dislike<br>a lot<br>很不喜歡        |

102 - 104. How do you feel about:

Using a hand-held calculator?

你對於使用手提計算机的感受如何?

- |      |                              |                    |                      |                            |                                    |
|------|------------------------------|--------------------|----------------------|----------------------------|------------------------------------|
| 102. | A. very<br>important<br>十分重要 | B. important<br>重要 | C. undecided<br>未能決定 | D. not<br>important<br>不重要 | E. not at all<br>important<br>絕不重要 |
| 103. | A. very easy<br>十分容易         | B. easy<br>容易      | C. undecided<br>未能決定 | D. hard<br>困難              | E. very hard<br>十分困難               |
| 104. | A. like<br>a lot<br>十分喜歡     | B. like<br>喜歡      | C. undecided<br>未能決定 | D. dislike<br>不喜歡          | E. dislike<br>a lot<br>很不喜歡        |



Express, on a five point scale, the extent of your agreement between the feeling expressed in each of the following statements and your own personal feelings. Mark the choice which best describes your feelings.

用一個五點標度來表達你對下列各項問題的感受。  
把你所選擇的加以標記。

105. Mathematics will change rapidly in the near future.  
在最近的將來數學會演變得很快速。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
106. Mathematics is a good field for creative people.  
對於有創造力的人，數學是一個好的研究範疇。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
107. There is little place for originality in solving mathematics problems.  
很難有創新性的方法去解答數學問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
108. New discoveries in mathematics are constantly being made.  
數學上不斷有新發現。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
109. Mathematics helps one to think according to strict rules.  
數學有助人根據嚴謹的規律去思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
110. Estimating is an important mathematics skill.  
「估計」是一項重要的數學技巧。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
111. There are many different ways to solve most mathematics problems.  
大多數的數學問題都可用多種不同的方法去解答。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

112. Learning mathematics involves mostly memorizing.  
學習數學大部份是靠記憶的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
113. In mathematics, problems can be solved without using rules.  
在數學上,不利用規則也可以解決問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
114. Trial and error can often be used to solve a mathematics problem.  
數學上的問題通常可以通過不斷摸索的途徑來解決。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
115. There is always a rule to follow in solving a mathematics problem.  
解答一個數學問題,總可以依着一些規則作為根據。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
116. There have probably not been any new discoveries in mathematics for a long time.  
大概有一段頗長的時間沒有甚麼數學上的新發現了。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
117. Mathematics is a set of rules.  
數學是一組規則。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
118. A mathematics problem can always be solved in different ways.  
一個數學問題時常都能由不同的方法解答。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
119. Mathematics helps one to think logically.  
數學可助人邏輯地思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
120. I really want to do well in mathematics.  
我真的很想把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



121. My parents really want me to do well in mathematics.  
我的父母真的想我把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
122. I am looking forward to taking more mathematics.  
我期望學習更多數學。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
123. I feel good when I solve a mathematics problem by myself.  
當我能親自解答一個數學問題時我覺得很欣慰。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
124. I usually understand what we are talking about in mathematics class.  
在數學堂中我通常都能明白在討論的事情。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
125. I am not so good at mathematics.  
我的數學並不太好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
126. I like to help others with mathematics problems.  
我樂於助人解答數學上的問題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
127. If I had my choice I would not learn any more mathematics.  
如果我可選擇，我便不會學更多的數學了。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
128. I feel challenged when I am given a difficult mathematics problem.  
我覺得面對一個數學難題如同接受一項挑戰。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



129. I refuse to spend a lot of my own time doing mathematics.  
我拒絕花太多時間在數學方面。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
130. Mathematics is harder for me than for most persons.  
與多數人比較, 數學對於我來說是較為困難的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
131. I could never be a good mathematician.  
我永遠不會成為一個優秀的數學家。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
132. No matter how hard I try I still do not do well in mathematics.  
無論我怎樣努力我仍然不能把數學做好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
133. I will work a long time in order to understand a new idea in mathematics.  
我會用一段很長的時間去瞭解一個新的數學概念。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
134. Working with numbers makes me happy.  
運算數字使我感到快樂。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
135. It scares me to have to take mathematics.  
規定要選修數學會令我感到恐懼。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
136. I usually feel calm when doing mathematics problems.  
做數學問題時, 我通常都是鎮定的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

137. I think mathematics is fun.  
我認為數學是有趣的。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
138. When I cannot figure out a problem, I feel as though I am lost in a maze of words and cannot find my way out.  
當我不能理解一個問題時，我會覺得好像是迷失於一個文字的迷宮裏而不能找到出路。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
139. Men make better scientists and engineers than women.  
男人做科學家和工程師總比女人好。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
140. Boys have more natural ability in mathematics than girls.  
男孩子在數學上的天份比女孩子高。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
141. Boys need to know more mathematics than girls.  
在數學方面，男孩子需要比女孩子知道得更多。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
142. A woman needs a career just as much as a man does.  
在事業方面，女人一如男人，有同樣的需要。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
143. It is important to know arithmetic to get a good job.  
要獲得一份好的工作，懂得算術是重要的。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
144. Most people do not use arithmetic in their jobs.  
大多數人在工作上都用不到算術。
- A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意

145. I would like to work at a job that lets me use mathematics.  
我喜歡做一份可讓我運用數學的工作。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
146. Mathematics is useful in solving everyday problems.  
數學對解決日常問題是有用的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
147. I can get along well in everyday life without using mathematics.  
不用數學我也能夠生活得很好。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
148. Most of mathematics has practical use on the job.  
大部份的數學對工作都有實際的用途。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
149. Mathematics is not needed in everyday living.  
在日常生活中是用不着數學的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
150. A knowledge of mathematics is not necessary in most occupations.  
在大多數行業中數學的知識是不需要的。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
151. Computers can think.  
電腦能夠思考。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
152. Someday computers will run everything.  
总有一天電腦能夠管理一切事務。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



153. Computers make learning mathematics more enjoyable.  
電腦令人學習數學更愉快。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
154. Everyone should learn about computers.  
每一個人都應該學用電腦。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
155. Using a hand calculator makes it more fun to solve problems in mathematics.  
用手提計算機能增添解答數學問題的樂趣。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
156. Mathematical ideas can be learned faster if you use a hand calculator.  
用手提計算機可助你把數學概念學習得更快。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
157. If you use a hand calculator you do not have to learn how to compute.  
用手提計算機,你便毋須要學習如何運算。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意
158. Using a hand calculator can help you learn many different mathematical topics.  
用手提計算機可助你學習更多不同的數學課題。  
A. Strongly Disagree B. Disagree C. Undecided D. Agree E. Strongly Agree  
十分反對 不同意 未能決定 同意 非常同意



INTERNATIONAL ASSOCIATION for the  
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**BOOKLET 16**

**SCHOOL QUESTIONNAIRE**

**FORM 1/MIDDLE 1 classes**

**SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81**

BOOKLET 16SCHOOL QUESTIONNAIREForm 1 / middle 1

This questionnaire has been designed to collect information needed for the cross-sectional portion of the Second IEA Mathematics Study. Among other things, outcomes of instruction in terms of performance on international achievement tests are related to certain 'input' factors, such as the facilities of the various school systems in terms of teacher training, number of hours of instruction, etc. We are aware that in some instances a question cannot be answered with complete accuracy unless the School Principal or the Head of Mathematics Department carries out time-consuming research. We want to avoid placing undue burdens on those answering the questionnaire, and therefore urge that estimates should be made in cases where the exact figures are not readily available.

This questionnaire is an international one, and some of the questions may appear to be irrelevant to the HONG KONG situation. However each question is designed to test part of a specific international hypothesis and should be answered if possible.

Any information you supply will be treated by the IEA Hong Kong Centre as confidential. None of it will be published in any reports or released to controlling authorities in a manner which would enable any individual school to be identified.

We feel sure you will be interested in the results of the project. If you have any particular questions, please write direct to:

Dr. Peter Tam  
IEA Hong Kong Centre  
School of Education  
University of Hong Kong  
Hong Kong

or telephone Mr. K.C. Cheung  
5-468161 ext. 684

Thank you for your assistance and cooperation.



SCHOOL QUESTIONNAIREForm 1 classesFOR OFFICIAL  
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Please answer each question by either writing  
your response in the space provided or by  
checking (✓) the appropriate box.

Country	01-02	_____
Study	03-04	_____
Population	05	_____
Stratum	06-07	_____
School	08-10	_____
Blank	11-12	_____
Blank	13-15	_____
Instrument	16-18	_____
Card	19	_____
	20	_____

SECTION A - SCHOOL PRINCIPAL TO ANSWER

1. What is the total enrollment of full-time (or full-time equivalent) secondary students in your school?

Boys \_\_\_\_\_

21-24 \_\_\_\_\_

Girls \_\_\_\_\_

25-28 \_\_\_\_\_

2. (a) What is the number of Form 1/middle 1 students in your school ?

Boys \_\_\_\_\_

29-31 \_\_\_\_\_

Girls \_\_\_\_\_

32-34 \_\_\_\_\_

- (b) What is the number of Form 1/middle 1 students who DO NOT take a mathematics course in your school ?

Boys \_\_\_\_\_

35-37 \_\_\_\_\_

Girls \_\_\_\_\_

38-40 \_\_\_\_\_

3. What is the number of the full-time (or full-time equivalent) teaching staff in your school ?  
No. of staff \_\_\_\_\_
4. How many of the teaching staff are involved in teaching one or more mathematics classes ?  
Male \_\_\_\_\_  
Female \_\_\_\_\_
5. How many of the teaching staff teach mathematics exclusively ?  
Male \_\_\_\_\_  
Female \_\_\_\_\_
6. How many of those who are teaching mathematics at any level hold tertiary qualifications which include mathematics as a major field of study ?  
Male \_\_\_\_\_  
Female \_\_\_\_\_
7. How many official school days are there per year ?  
No. of days \_\_\_\_\_
8. What is the average number of periods per school day ?  
No. of periods \_\_\_\_\_
9. What is the average length of each period in minutes ?  
Length of period \_\_\_\_\_
10. In your school for Form 1/middle 1 in which subject(s) is the use of calculators encouraged ?  
Tick (✓) one.
- |   |                          |
|---|--------------------------|
| None  | <input type="checkbox"/> |
| Mathematics only                            | <input type="checkbox"/> |
| Science only                                | <input type="checkbox"/> |
| Mathematics and Science                     | <input type="checkbox"/> |
| All or most subject where usage appropriate | <input type="checkbox"/> |

41-43 \_\_\_\_\_

44-45 \_\_\_\_\_

46-47 \_\_\_\_\_

48-49 \_\_\_\_\_

50-51 \_\_\_\_\_

52-53 \_\_\_\_\_

54-55 \_\_\_\_\_

56-58 \_\_\_\_\_

59-60 \_\_\_\_\_

61-62 \_\_\_\_\_

63 \_\_\_\_\_

SECTION B      HEAD OF MATHEMATICS DEPARTMENT (MATHEMATICS PANEL  
CHAIRMAN) TO ANSWER

11. How frequently are meetings of the mathematics teachers held in the school ?

64 \_\_\_\_\_

Never	<input type="checkbox"/>
Less frequently than once a term	<input type="checkbox"/>
Once a term	<input type="checkbox"/>
Once every month	<input type="checkbox"/>
Once every two weeks	<input type="checkbox"/>
Once a week or more frequently	<input type="checkbox"/>

12. Which of the following activities occupies most of the time at the mathematics teachers meetings ?

65 \_\_\_\_\_

Organizational and administrative matters	<input type="checkbox"/>
Content to be taught	<input type="checkbox"/>
Teaching strategies	<input type="checkbox"/>
Professional development of teachers	<input type="checkbox"/>

13. Which of the following best describes your panel's policy on the use by students in Form1/middle 1 of 'four function' calculators in the mathematics classroom ?

66 \_\_\_\_\_

No policy formulated. Teachers allow use as they see fit.	<input type="checkbox"/>
Students are forbidden to use calculators in the classroom.	<input type="checkbox"/>
Students may use calculators but they are not provided by the school.	<input type="checkbox"/>
Calculators are provided by the school but used only rarely in the classroom.	<input type="checkbox"/>
Calculators are provided by the school and used frequently in the classroom.	<input type="checkbox"/>
Question does not arise (e.g., calculators are not available to students).	<input type="checkbox"/>



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14. Which of the following best describes your panel's policy on the use by students in Form 1/middle 1 of pre-programmed multifunction and/or programmable calculators in the classroom ? 67 \_\_\_\_\_

No policy formulated. Teachers allow use as they see fit. ☐

Students are forbidden to use calculators in the classroom. ☐

Students may use calculators but they are not provided by the school. ☐

Calculators are provided by the school but used only rarely in the classroom. ☐

Calculators are provided by the school and used frequently in the classroom. ☐

Question does not arise (e.g., calculators not available to students). ☐

15. Does setting or streaming take place in mathematics in Form 1/middle 1 in your school ? (Setting would mean that students of similar mathematical ability are grouped together ; streaming that students of similar general ability are grouped together for instruction.) 68 \_\_\_\_\_

Yes ☐

No ☐

16. Which of the following best describes mathematics teaching in your school ? 69 \_\_\_\_\_

Boys and girls take the same curriculum and are taught together ☐

Boys and girls take the same curriculum and are taught separately. ☐

Boys and girls take different curricula. ☐

Question inappropriate, (i.e., boys or girls school). ☐



INTERNATIONAL ASSOCIATION for the  
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**BOOKLET 17**  
**SCHOOL QUESTIONNAIRE**

**SIXTH FORMS**

**SECOND STUDY OF MATHEMATICS**  
**HONG KONG 1980/81**

SCHOOL QUESTIONNAIRE

SIXTH FORMS

This questionnaire has been designed to collect information needed for the cross-sectional portion of the Second IEA Mathematics Study. Amongst other things, outcomes of instruction in terms of performance on international achievement tests are related to certain 'input' factors, such as the facilities of the various school systems in terms of teacher training, number of hours of instruction etc. We are aware that in some instances a question cannot be answered with complete accuracy unless the School Principal or the Head of Mathematics Department carries out time-consuming research. We want to avoid placing undue burdens on those answering the questionnaire, and therefore urge that estimates should be made in cases where the exact figures are not readily available.

This questionnaire is an international one, and some of the questions may appear to be irrelevant to the Hong Kong situation. However each questions is designed to test part of a specific international hypothesis and should be answered if possible.

Any information you supply will be treated by the IEA Hong Kong Centre as confidential. None of it will be published in any reports or released to controlling authorities in a manner which would enable any individual to be identified.

We feel sure you will be interested in the results of the project. If you have any particular questions, please write direct to :

Dr. Peter Tam  
School of Education  
University of Hong Kong  
HONG KONG

or telephone

Mr. K.C. Cheung  
5-468161 ext. 684

Thank you for your assistance and cooperation.



SCHOOL QUESTIONNAIREFOR OFFICIAL  
USE ONLYSIXTH FORMS

Please answer each question by either writing your response in the space provided or by checking the appropriate box

Country	01-02	_____
Study	03-04	_____
Population	05	_____
Stratum	06-07	_____
School	08-10	_____
Blank	11-12	_____
Blank	13-15	_____
Instrument	16-18	_____
Card	19	_____
	20	_____

1. What is the total enrollment of full-time (or full-time equivalent) secondary students in your school?

Boys \_\_\_\_\_

21-24 \_\_\_\_\_

Girls \_\_\_\_\_

25-28 \_\_\_\_\_

2. (a) What is the number of Form 6/Form 7 mathematics \* students in your school ?

Form 6

Form 7

Boys \_\_\_\_\_

Boys \_\_\_\_\_

29-31 \_\_\_\_\_

Girls \_\_\_\_\_

Girls \_\_\_\_\_

32-34 \_\_\_\_\_

- (b) What is the number of Form 6/Form 7 students who DO NOT take a mathematics course \*\* in your school ?

Form 6

Form 7

Boys \_\_\_\_\_

Boys \_\_\_\_\_

35-37 \_\_\_\_\_

Girls \_\_\_\_\_

Girls \_\_\_\_\_

39-40 \_\_\_\_\_

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.

\*\* i.e. those students who do not take mathematics at all or who have mathematics instructions less than six periods per cycle.

FOR OFFICIAL  
USE ONLY

3. What is the number of the full-time (or full-time equivalent) teaching staff in your school ?

No. of staff \_\_\_\_\_

41-43 \_\_\_\_\_

4. How many of the teaching staff are involved in teaching one or more mathematics classes ?

Male \_\_\_\_\_

Female \_\_\_\_\_

44-45 \_\_\_\_\_

46-47 \_\_\_\_\_

5. How many of the teaching staff teach mathematics exclusively ?

Male \_\_\_\_\_

Female \_\_\_\_\_

48-49 \_\_\_\_\_

50-51 \_\_\_\_\_

6. How many of those who are teaching mathematics at any level hold tertiary qualifications which include mathematics as a major field of study ?

Male \_\_\_\_\_

Female \_\_\_\_\_

52-53 \_\_\_\_\_

54-55 \_\_\_\_\_

7. How many official school days are there per year ?

No. of days \_\_\_\_\_

56-58 \_\_\_\_\_

8. What is the average number of periods per school day ?

No. of periods \_\_\_\_\_

59-60 \_\_\_\_\_

9. What is the average length of each period in minutes ?

Length of period \_\_\_\_\_

61-62 \_\_\_\_\_

10. In your school, for Sixth Form Mathematics, \* in which subject(s) is the use of calculators encouraged ?

63 \_\_\_\_\_

Check one.

None

☐

Mathematics only

☐

Science only

☐

Mathematics and science

☐

All or most subjects where usage appropriate

☐

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.

FOR OFFICIAL  
USE ONLYSECTION B. HEAD OF MATHEMATICS DEPARTMENT (MATHEMATICS PANEL  
CHAIRMAN) TO ANSWER.

11. How frequently are meetings of the mathematics teachers held in the school ?

64

- Never ☐
- Less frequently than once a semester or term ☐
- Once every term or semester ☐
- Once every month ☐
- Once every two weeks ☐
- Once a week or more frequently ☐

12. Which of the following activities occupies most of the time at the mathematics teachers meetings ?

65

- Organizational and administrative matters ☐
- Content to be taught ☐
- Teaching strategies ☐
- Professional development of teachers ☐

13. Which of the following best describes your panel's policy on the use by students in sixth form mathematics \* of 'four function' calculators in the mathematics classroom ?

66

- No policy formulated. Teachers allow use as they see fit. ☐
- Students are forbidden to use calculators in the classroom. ☐
- Students may use calculators but they are not provided by the school. ☐
- Calculators are provided by the school but used only rarely in the classroom. ☐
- Calculators are provided by the school and used frequently in the classroom. ☐
- Question does not arise ( e.g. calculators are not available to students). ☐

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.



FOR OFFICIAL  
USE ONLY

14. Which of the following best describes your panel's policy on the use by students in sixth forms mathematics \* of pre-programmed multifunction and/or programmable calculators in the classroom ?

67

No policy formulated. Teachers allow use as they see fit. ☐

Students are forbidden to use calculators in the classroom. ☐

Students may use calculators but they are not provided by the school. ☐

Calculators are provided by the school but used only rarely in the classroom. ☐

Calculators are provided by the school and used frequently in the classroom. ☐

Question does not arise (e.g. calculators not available to students). ☐

15. Does setting or streaming take place in sixth forms mathematics \* in your school ? (Setting would mean that students of similar mathematical ability are grouped together ; streaming that students of similar general ability are grouped together for instruction)

Form 6

Form 7

Yes ☐

Yes ☐

No ☐

No ☐

68

16. Which of the following best describes mathematics teaching in your school ?

69

Boys and girls take the same curriculum and are taught together. ☐

Boys and girls take the same curriculum and are taught separately. ☐

Boys and girls take different curricula. ☐

Question inappropriate, (i.e., boys or girls school). ☐

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INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

**BOOKLET 20**

**TEACHER QUESTIONNAIRE**

**FORM 1/MIDDLE 1 classes**

**SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81**

BOOKLET 20TEACHER QUESTIONNAIREFORM 1 / MIDDLE 1

During 1980/1981 a battery of tests and questionnaires is being given to samples of students in about twenty-six countries as part of a large scale international research project in mathematics. The project, known as the Second IEA Mathematics Study, will investigate the relationships between students' achievement in mathematics and various school, teacher and home factors which may influence this achievement.

As part of the research programme the test battery is being given to a sample of students from your school. We also need information about various teacher factors. It is for this reason we are asking you to complete this questionnaire.

We realise that, in common with many mathematics teachers in Hong Kong you are probably very busy and are working under difficult conditions. However, as a mathematics teacher you will be aware that research, including educational research, depends upon accurate measurement. We, therefore, urge you to co-operate by completing the questionnaire as accurately as you can. May we stress that all information you supply will be treated by the IEA Hong Kong Centre as confidential. None of it will be made available to school principals or education department officials, or published in any reports in a manner which would permit an individual teacher or school to be identified directly or indirectly.

Please answer on the questionnaire and when you have finished it, seal it in the envelope provided and return it to the School Co-ordinator.

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Hong kong

or telephone Mr. K.C. Cheung  
5-468161 ext. 684

Thank you for your assistance and co-operation.



## TEACHER QUESTIONNAIRE

## FORM 1 / MIDDLE 1

## SECTION A

FOR OFFICIAL  
USE ONLY

Please answer each question by writing your response in the space provided, by ticking (✓) the appropriate box (or by circling your choice).

Country  
Study  
Population  
Stratum  
School  
Class  
Teacher Identity  
Instrument  
Card

01-02 \_\_\_\_\_  
03-04 \_\_\_\_\_  
05 \_\_\_\_\_  
06-07 \_\_\_\_\_  
08-10 \_\_\_\_\_  
11-12 \_\_\_\_\_  
13-15 \_\_\_\_\_  
16-18 \_\_\_\_\_  
19 \_\_\_\_\_

1. Your sex

Female

☐

Male

☐

20 \_\_\_\_\_

2. Your age \_\_\_\_\_ years.

21-22 \_\_\_\_\_

3. How many years' experience have you had as a teacher (including the current Year) ?  
(Express part-time experience as full-time equivalent)

No. of years \_\_\_\_\_ (round to nearest year)

23-24 \_\_\_\_\_

4. How many of these years have been spent teaching mathematics to Form 1/Middle 1 students ?

No. of years \_\_\_\_\_ (round to nearest year)

25-26 \_\_\_\_\_

5. For how many full-time (or full-time equivalent) years did you study for your degree or other post-secondary academic qualification ?

No. of years \_\_\_\_\_

27-28 \_\_\_\_\_

What proportion of this study was exclusively devoted to mathematics ?

0 ☐ 1/5 ☐ 2/5 ☐ 3/5 ☐ 4/5 ☐ 1 ☐

6. For how many full-time (or full-time equivalent) years did you engage in professional preparation as a teacher ?

No. of years \_\_\_\_\_

29 \_\_\_\_\_

What proportion of this preparation was exclusively devoted to the teaching of mathematics (instruction and supervised practice)?

0 ☐ 1/5 ☐ 2/5 ☐ 3/5 ☐ 4/5 ☐ 1 ☐

30 \_\_\_\_\_

7. What is your total number of teaching periods (i.e., class contact periods) per week ?

No. of periods \_\_\_\_\_

31-32 \_\_\_\_\_

8. How many of these periods per week do you spend teaching mathematics ?

No. of periods \_\_\_\_\_

33-34 \_\_\_\_\_

9. In addition to teaching mathematics, do you have any of the following duties ?

- |   |                              |                             |    |       |
|---|------------------------------|-----------------------------|----|-------|
| (a) Teacher of science                  | Yes <input type="checkbox"/> | No <input type="checkbox"/> | 35 | _____ |
| (b) Teacher in other areas              | Yes <input type="checkbox"/> | No <input type="checkbox"/> | 36 | _____ |
| (c) Head, Mathematics Department        | Yes <input type="checkbox"/> | No <input type="checkbox"/> | 37 | _____ |
| (d) School Administrator - General      | Yes <input type="checkbox"/> | No <input type="checkbox"/> | 38 | _____ |
| (e) School Administrator - Subject Area | Yes <input type="checkbox"/> | No <input type="checkbox"/> | 39 | _____ |

10. Enter the number of classes and the number of hours you teach (any subject) per week at each of the following levels :

(a) Form 1 / Middle 1 \_\_\_\_\_ classes

40 \_\_\_\_\_

\_\_\_\_\_ hours per week

41-42 \_\_\_\_\_

(b) Higher than Form 1 / Middle 1 \_\_\_\_\_ classes

43 \_\_\_\_\_

\_\_\_\_\_ hours per week

44-45 \_\_\_\_\_

11. How many subjects do you teach to students in the target class (i.e. class selected for this study) ?

46 \_\_\_\_\_

47-48 \_\_\_\_\_

Only mathematics ☐

Mathematics and at least one (but not all) other subjects ☐

49 \_\_\_\_\_

All subjects ☐

FOR OFFICIAL  
USE ONLYInformation on the target class

12. How many teachers, apart from yourself and the occasional day reliever, have taught mathematics to the target class this school year ?

No. of teachers \_\_\_\_\_

50 \_\_\_\_\_

13. How many students are currently enrolled in the target class ?

No. of students \_\_\_\_\_

51-52 \_\_\_\_\_

14. How many periods of mathematics instruction does this target class receive each week ?

No. of periods \_\_\_\_\_

53-54 \_\_\_\_\_

15. What is the average length of each class period (in minutes) ?

No. of minutes \_\_\_\_\_

55-56 \_\_\_\_\_

16. How many hours (approximately) of mathematics instruction will the target class have received by the end of the school year ?

No. of hours \_\_\_\_\_

57-59 \_\_\_\_\_

17. How does the target class compare with other Form 1/middle 1 mathematics classes in your school in terms of mathematical ability ? Tick one (✓)

60 \_\_\_\_\_

There are no other form 1/middle 1 classes  
in the school ☐Higher ☐About the same ☐Lower ☐

18. In your estimation how wide is the range of mathematics abilities in the target class ?

61 \_\_\_\_\_

Very wide ☐Fairly wide ☐Fairly narrow ☐Very narrow ☐



FOR OFFICIAL  
USE ONLY

19. What percentage of the target class do you consider entered the class with a sufficient degree of mastery of primary 6 curricula ?

62-64

Percentage of class \_\_\_\_\_

20. How would you characterize the main mathematics subject matter taught in the target class ?

65

Remedial

☐

Typical

☐

Enriched or accelerated

☐

21. Estimate the number of students in the target class who fit in each of the following categories (the sum of your answers should equal the total number of students in the class) in terms of mathematical ability.

Top third of Form 1/Middle 1 students in Hong Kong

\_\_\_\_\_ students

66-67

Middle third of Form 1/Middle 1 students in Hong Kong

\_\_\_\_\_ students

68-69

Bottom third of Form 1/Middle 1 students in Hong Kong

\_\_\_\_\_ students

70-71

Unable to judge

\_\_\_\_\_ students

72-73

FOR OFFICIAL  
USE ONLYNew Card

22. Think about what you did with the target class last week and during whatever you consider a typical week. In both cases ESTIMATE THE NUMBER OF MINUTES spent by you on each of the following :

Preparation and planning for mathematics (OUTSIDE class contact time and not including time grading papers and routine marking of homework).

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

20-22 \_\_\_\_\_

Marking student papers, quizzes and tests OUTSIDE class

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

23-25 \_\_\_\_\_

Explaining mathematics content NEW to the class (to more than one student at a time)

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

26-28 \_\_\_\_\_

Revising mathematics content NOT NEW to the class (with more than one student at a time)

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

29-31 \_\_\_\_\_

Routine administration (e.g., marking roll, making school announcements, setting up equipment, etc.)

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

32-34 \_\_\_\_\_

Establishing and maintaining class order and disciplining students during class time.

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

35-37 \_\_\_\_\_

23. Now estimate the average time per student spent by the target class on each of the following :

Taking tests and quizzes

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

38-40 \_\_\_\_\_

Doing seat work or blackboard work (students preparing individual written answers to assigned exercises or problems, not counting tests or quizzes)

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

41-43 \_\_\_\_\_

Listening as a whole class when you are giving lectures or explanations.

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

44-46 \_\_\_\_\_

Working in small groups

Last week \_\_\_\_\_ mins

Typical week \_\_\_\_\_ mins

47-49 \_\_\_\_\_

50-52 \_\_\_\_\_

53-55 \_\_\_\_\_

56-58 \_\_\_\_\_

59-61 \_\_\_\_\_

62-64 \_\_\_\_\_

65-67 \_\_\_\_\_

68-70 \_\_\_\_\_

71-73 \_\_\_\_\_

74-76 \_\_\_\_\_

77-79 \_\_\_\_\_

FOR OFFICIAL  
USE ONLYNew Card

24. In a typical week, during an average complete period in the target class, how many DIFFERENT students did you call upon to answer oral questions ?

Up to 1/4 of the class

☐

More than 1/4, up to 1/2

☐

More than 1/2, up to 3/4

☐

More than 3/4 of the class

☐

20

25. How often are some students in the target class asked to do exercises or problem assignments which are different from those given other students in the class ?

Frequently

☐

Occasionally

☐

Rarely or never

☐

21

26. How many hours per week do you think have been needed by a typical student in the target class to complete the assigned homework (i.e. work to be completed outside class contact hours) ?

Last week No. of hours \_\_\_\_\_

22-23

Typical week No. of hours \_\_\_\_\_

24-25

27. In your target class about how often are calculators used in mathematics ?

During two periods or more  
per weekFour function☐Pre-programmed  
(scientific)  
and/or Programmable☐

During one period per week

☐☐

26

Occasionally (not every week)

☐☐

27

Never

☐☐

Calculators not allowed

☐☐



FOR OFFICIAL  
USE ONLY

28. Which of these do you encourage your (target class) students to do? (i.e. to consider whether you encourage your students to use each of these machines in each of these activities.) (Fill in each cell with N for No, Y for Yes)

	Four function calculator	Pre-programmed (scientific) and/or Programmable Calculator	Computer	
To check answers to exercises				28 _____
To do homework				29 _____
As an aid to solve problems				30 _____
To take tests				31 _____
As an aid to do projects				32 _____
For recreation				33 _____

29. By the end of the school year, indicate the approximate number of teaching periods you expect to have spent on the following topics in the target class. Please indicate whether this time is spent continuously or whether you leave a topic and return to it later (e.g. reviewing it).

	Approximate no. of teaching periods	Yes	No	Do you leave it and return (review)?	
Common Fractions	_____	<input type="checkbox"/>	<input type="checkbox"/>		34-35 _____
					36 _____
Decimal Fractions	_____	<input type="checkbox"/>	<input type="checkbox"/>		37-38 _____
					39 _____
Ratio and Proportion	_____	<input type="checkbox"/>	<input type="checkbox"/>		40-41 _____
					42 _____
Percentage	_____	<input type="checkbox"/>	<input type="checkbox"/>		43-44 _____
					45 _____
Measurement	_____	<input type="checkbox"/>	<input type="checkbox"/>		46-47 _____
					48 _____
Geometry	_____	<input type="checkbox"/>	<input type="checkbox"/>		49-50 _____
					51 _____
Formulae and Equations	_____	<input type="checkbox"/>	<input type="checkbox"/>		52-53 _____
					54 _____
Integers	_____	<input type="checkbox"/>	<input type="checkbox"/>		55-56 _____
					57 _____
Probability & statistics	_____	<input type="checkbox"/>	<input type="checkbox"/>		58-59 _____
					60 _____

FOR OFFICIAL  
USE ONLY

30. Indicate how often you use each of the following in your instruction to your target class.

	Rarely or Never	Sometimes	Often
Published textbooks (containing both explanations and exercises)			
Published workbooks or published problem sets (containing exercises only)			
Individualized material (e.g., programmed instruction)			
Commercially produced visual materials			
Commercially published tests			
Teaching materials (including exercises) you have prepared Yourself			
Tests you have written yourself			

61

62

63

64

65

66

67

31. Give the name of the textbooks or commercially prepared workbooks you most commonly use with the target class.

68-69

## TEACHER QUESTIONNAIRE

FORM 1 / MIDDLE 1

## SECTION B

FOR OFFICIAL  
USE ONLY

Students have been asked to respond to the questions below as learners. You are asked to respond to these same questions as teachers, indicating what you feel about the teaching of each of these mathematics activities. Circle the response you choose.

Country	01-02
Study	03-04
Population	05
Stratum	06-07
School	08-10
Class	11-12
Teacher Identity	13-15
Instrument	16-18
Card	19

32. Checking an answer to a problem by going back over it.

- |    |                   |           |           |                  |                         |    |       |
|----|-------------------|-----------|-----------|------------------|-------------------------|----|-------|
| a. | very<br>important | important | undecided | not<br>important | not at all<br>important | 20 | _____ |
| b. | very easy         | easy      | undecided | hard             | very hard               | 21 | _____ |
| c. | like a lot        | like      | undecided | dislike          | dislike a<br>lot        | 22 | _____ |

33. Memorising rules and formulae.

- |    |                   |           |           |                  |                         |    |       |
|----|-------------------|-----------|-----------|------------------|-------------------------|----|-------|
| a. | very<br>important | important | undecided | not<br>important | not at all<br>important | 23 | _____ |
| b. | very easy         | easy      | undecided | hard             | very hard               | 24 | _____ |
| c. | like a lot        | like      | undecided | dislike          | dislike a<br>lot        | 25 | _____ |

34. Solving word problems.

- |    |                   |           |           |                  |                         |    |       |
|----|-------------------|-----------|-----------|------------------|-------------------------|----|-------|
| a. | very<br>important | important | undecided | not<br>important | not at all<br>important | 26 | _____ |
| b. | very easy         | easy      | undecided | hard             | very hard               | 27 | _____ |
| c. | like a lot        | like      | undecided | dislike          | dislike a<br>lot        | 28 | _____ |

35. Estimating answers to problems.

- |    |                   |           |           |                  |                         |    |       |
|----|-------------------|-----------|-----------|------------------|-------------------------|----|-------|
| a. | very<br>important | important | undecided | not<br>important | not at all<br>important | 29 | _____ |
| b. | very easy         | easy      | undecided | hard             | very hard               | 30 | _____ |
| c. | like a lot        | like      | undecided | dislike          | dislike a<br>lot        | 31 | _____ |



Decide the extent of the agreement between the feeling expressed in each statement and your own personal feelings. Circle the response you choose.

FOR OFFICIAL  
USE ONLY

36. Mathematics will change rapidly in the near future.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

32

37. Mathematics is a good field for creative people.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

33

38. There is little place for originality in solving mathematics problems.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

34

39. New discoveries in mathematics are constantly being made.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

35

40. Mathematics helps one to think according to strict rules.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

36

41. Estimating is an important mathematics skill.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

37

42. There are many different ways to solve most mathematics problems.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

38

43. Learning mathematics involves mostly memorizing.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

39

44. In mathematics, problems can be solved without using rules.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

40

45. Trial and error can often be used to solve a mathematics problem.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

41

FOR OFFICIAL  
USE ONLY

46. There is always a rule to follow in solving a mathematics problem.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

42

47. There have not been any new discoveries in mathematics for a long time.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

43

48. Mathematics is a set of rules.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

44

49. A mathematics problem can always be solved in different ways.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

45

50. Mathematics helps one to think logically.

Strongly Disagree      Disagree      Undecided      Agree      Strongly Agree

46



INTERNATIONAL ASSOCIATION for the  
EVALUATION of EDUCATIONAL ACHIEVEMENT

BOOKLET 21

TEACHER QUESTIONNAIRE

SIXTH FORMS

029

95

18

SECOND STUDY OF MATHEMATICS  
HONG KONG 1980/81



TEACHER QUESTIONNAIRESIXTH FORMS

During 1980/1981 a battery of tests and questionnaires is being given to samples of students in about twenty-six countries as part of a large scale international research project in mathematics. The project, known as the Second IEA Mathematics Study, will investigate the relationships between students' achievement in mathematics and various school, teacher and home factors which may influence this achievement.

As part of the research programme the test battery is being given to a sample of students from your school. We also need information about various teacher factors. It is for this reason we are asking you to complete this questionnaire.

We realise that, in common with many mathematics teachers in Hong Kong you are probably very busy and are working under difficult conditions. However, as a mathematics teacher you will be aware that research, including educational research, depends upon accurate measurement. We, therefore, urge you to co-operate by completing the questionnaire as accurately as you can. May we stress that all information you supply will be treated by the IEA Hong Kong Centre as confidential. None of it will be made available to school principals or education department officials, or published in any reports in a manner which would permit an individual teacher or school to be identified directly or indirectly.

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School of Education  
University of Hong Kong  
HONG KONG.

or telephone Mr. K.C. Cheung  
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Thank you for your assistance and co-operation.

## TEACHER QUESTIONNAIRE

## SIXTH FORMS

## Section A

FOR OFFICIAL  
USE ONLY

Please answer each question by writing your response in the space provided, by ticking (✓) the appropriate box (or by circling your choice).

Country  
Study  
Population  
Stratum  
School  
Class  
Teacher Identity  
Instrument  
Card

01-02 43  
03-04 01  
05 2  
06-07 1  
08-10 1  
11-12 01  
13-15 22  
16-18 230  
19 1

1. Your sex

Female ☒

Male ☐

20 1

2. Your age 26 years.

21-22 26

3. How many years' experience have you had as a teacher (including the current year) ?  
(Express part-time experience as full-time equivalent)

No. of years 4 (round to nearest year)

23-24 04

4. How many of these years have been spent teaching mathematics to sixth form students ?

No. of years 3 (round to nearest year)

25-26 03

5. For how many full-time (or full-time equivalent) years did you study for your degree or other post secondary academic qualification ?

No. of years 3

What proportion of this study was exclusively devoted to mathematics?

27-28 03

0 ☐ 1/5 ☐ 2/5 ☒ 3/5 ☐ 4/5 ☐ 1 ☐

6. For how many full-time (or full-time equivalent) years did you engage in professional preparation as a teacher ?

No. of years 0

29 0

What proportion of this preparation was exclusively devoted to the teaching of mathematics (instruction and supervised practice) ?

0 ☒ 1/5 ☐ 2/5 ☐ 3/5 ☐ 4/5 ☐ 1 ☐

30 0

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What is your total number of teaching periods (i.e., class contact periods) per week ?

No. of periods 28

31-32 28

8. How many of these periods per week do you spend teaching mathematics? 33-34 28

No. of periods 28

In addition to teaching mathematics, do you have any of the following duties ?

(a) Teacher of science	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	35	<u>2</u>
(b) Teacher in other areas	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	36	<u>2</u>
(c) Head, Mathematics Department	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	37	<u>2</u>
(c) School Administrator - General	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	38	<u>2</u>
(e) School Administrator - Subject Area	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	39	<u>2</u>

10. Enter the number of classes and the number of hours you teach (any subject) per week at each of the following levels :

(a) <del>Lower 6/Middle 6/Upper 6</del>	<u>1</u> classes	40	<u>1</u>
	<u>6.67</u> hours per week	41-42	<u>07</u>
(b) Lower than Lower 6/Middle 6/Upper 6	<u>3</u> classes	43	<u>3</u>
	<u>12</u> hours per week	44-45	<u>12</u>

11. How many subjects do you teach to students in the target class (i.e. class of mathematics\*students selected for this study) ?

Only mathematics

☒

46 9

Mathematics and at least one (but not all) other subjects

☐

47-48 99

All subjects

☐

49 1

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.



FOR OFFICIAL  
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12. How many teachers, apart from yourself and the occasional day reliever, have taught mathematics to the target class this school year ?

No. of teachers 050 0

13. How many students are currently enrolled in the target class ?

No. of students 1051-52 10

14. How many periods of mathematics instruction does this target class receive each week ?

No of periods 1053-54 10

15. What is the average length of each class period (in minutes) ?

No. of minutes 4055-56 40

16. How many hours (approximately) of mathematics instruction will the target class have received by the end of the school year ?

No. of hours 26757-59 267

17. How does the target class compare with other sixth form mathematics \* classes in your school in terms of mathematical ability ? (Check one)

There are no other sixth form mathematics classes ☒ in the schoolHigher ☐About the same ☐Lower ☐60 1

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.

3

18. In your estimation how wide is the range of mathematics abilities in the target class ?

Very wide ☐Fairly wide ☐Fairly narrow ☒Very narrow ☐61 3

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19. What percentage of the target class do you consider entered the class with a sufficient degree of mastery of previous curricula ?

62-64 070Percentage of class 70

20. How would you characterise the main mathematics subject matter taught in the target class ?

65 2

Remedial

☐

Typical

☒

Enriched or accelerated

☐

21. Estimate the number of students in the target class (i.e. class of mathematics \* students selected for this study) who fit in each of the following categories (the sum of your answers should equal the total number of students in the class) in terms of mathematical ability

Top third of sixth form mathematics \*  
students in Hong Kong \_\_\_\_\_ students

66-67 00

Middle third of sixth form mathematics \*  
students in Hong Kong 7 students

68-69 07

Bottom third of sixth form mathematics \*  
students in Hong Kong 3 students

70-71 03

Unable to judge \_\_\_\_\_ students

72-73 00

\* Only those students whose instruction in mathematics is six periods per cycle or more. They need not be students whose major is mathematics.

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New card

Think about what you did with the target class last week and during whatever you consider a typical week. In both cases ESTIMATE THE NUMBER OF MINUTES spent by you on each of the following :

Preparation and planning for mathematics (OUTSIDE class contact time and not including time grading papers and routine marking of homework).

Last week 240 minsTypical week 240 mins20-22 24023-25 240

Marking student papers, quizzes and tests OUTSIDE class

26-28 06029-31 120Last week 60 minsTypical week 120 mins

Explaining mathematics content NEW to the class (to more than one student at a time)

32-34 24035-37 240Last week 240 minsTypical week 240 mins

Revising mathematics content NOT NEW to the class (with more than one student at a time).

38-40 00041-43 030Last week 0 minsTypical week 30 mins

Routine administration (e.g., marking roll, making school announcements, setting up equipment etc.)

44-46 00047-49 000Last week 0 minsTypical week 0 mins

Establishing and maintaining class order and disciplining students during class time.

50-52 00053-55 000Last week 0 minsTypical week 0 mins

Now estimate the average time per student spent by the target class on each of the following :

Taking tests and quizzes

56-58 00059-61 120Last week 0 minsTypical week 120 mins

Doing seat work or blackboard work (students preparing individual written answers to assigned exercises or problems, not counting tests or quizzes)

62-64 30065-67 300Last week 300 minsTypical week 300 mins

Listening as a whole class when you are giving lectures or explanations

68-70 24071-73 240Last week 240 minsTypical week 240 mins

Working in small groups

74-76 00077-79 000Last week 0 minsTypical week 0 mins



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24. In a typical week, during an average complete period in the target class how many DIFFERENT students did you call upon to answer oral questions ?

20 4Up to 1/4 of the class ☐More than 1/4, up to 1/2 ☐More than 1/2, up to 3/4 ☐More than 3/4 of the class ☒

25. How often are some students in the target class asked to do exercises or problem assignments which are different from those given other students in the class ?

Frequently ☐Occasionally ☐Rarely or never ☒21 1

26. How many hours per week do you think have been needed by a typical student in the target class to complete the assigned homework (i.e., work to be completed outside class contact hours) ?

Last week No. of hours 4 722-23 07Typical week No. of hours 724-25 07

27. In your target class about how often are calculators used in mathematics ?

	<u>Four function</u>	<u>Pre-programmed (scientific) and/or Programmable</u>
During two periods or more per week	<input type="checkbox"/>	<input type="checkbox"/>
During one period per week	<input type="checkbox"/>	<input type="checkbox"/>
Occasionally (not every week)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Never	<input type="checkbox"/>	<input type="checkbox"/>
Calculators not allowed	<input type="checkbox"/>	<input type="checkbox"/>

26 327 3

28. Which of these do you encourage your (target class) students to do ? (i.e. to consider whether you encourage your students to use each of these machines in each of these activities.)  
(Fill in each cell with N for No, Y for Yes)

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	Four function Calculator	Pre-programmed and/or Programmable Calculator	Computer		
To check answers to exercises	Y	Y	N	28	<u>4</u>
To do homework	Y	Y	N	29	<u>4</u>
As an aid to solve problems	Y	Y	Y	30	<u>7</u>
To take tests	Y	Y	N	31	<u>4</u>
As an aid to do projects	Y	Y	Y	32	<u>7</u>
For recreation	N	N	Y	33	<u>3</u>

29. By the end of the school year, indicate the approximate number of teaching periods you expect to have spent on the following topics in the target class. Please indicate whether this time is spent continuously or whether you leave a topic and return to it later (e.g. reviewing it).

	Approximate no. of teaching periods	Yes	Do you leave it and return (review) ?	No		
Sets, relations and functions	<u>40</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		34-35	<u>40</u>
Complex numbers	<u>40</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		36	<u>2</u>
Algebra	<u>120</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		37-38	<u>40</u>
Geometry	<u>120</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		39	<u>2</u>
Differentiation	<u>200</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		40-41	<u>99</u>
Integration	<u>200</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		42	<u>2</u>
Probability and statistics	<u>40</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		43-44	<u>99</u>
Combinatorics	<u>40</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		45	<u>2</u>
Computer Science	<u>0</u>	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>		46-47	<u>99</u>
					48	<u>2</u>
					49-50	<u>99</u>
					51	<u>2</u>
					52-53	<u>40</u>
					54	<u>2</u>
					55-56	<u>40</u>
					57	<u>2</u>
					58-59	<u>99</u>
					60	<u>2</u>

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50. Indicate how often you use each of the following in your instruction to your target class ?

	Rarely or never	Sometimes	Often		
Published textbooks (containing both explanations and exercises)			✓	61	<u>3</u>
Published workbooks or published problem sets (containing exercises only)		✓		62	<u>2</u>
Individualised material (e.g., programmed instruction)	✓			63	<u>1</u>
Commercially produced visual materials	✓			64	<u>1</u>
Commercially published tests		✓		65	<u>2</u>
Teaching materials (including exercises) you have prepared yourself		✓		66	<u>2</u>
Tests you have written yourself	✓			67	<u>1</u>

51. Write the names of the textbooks or commercially prepared workbooks you most commonly use with the target class

68-69

Green  
S.R. Hsieh

Pure Mathematics  
Teach yourself Calculus.

Y.L. Ho

Problem solver  
A-Level Matrix Pure Maths.

L.H. Xip

Aids to Advanced Level Pure Maths.

Joseph Blakey.

University Maths.



TEACHER QUESTIONNAIREPOPULATION BSECTION BFOR OFFICIAL  
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Students have been asked to respond to the questions below as learners. You are asked to respond to these same questions as teachers, indicating what you feel about the teaching of each of these mathematics activities.

Circle the response you choose.

Country	01-02
Study	03-04
Population	05
Stratum	06-07
School	08-10
Class	11-12
Teacher Identity	13-15
Instrument	16-18
Card	19 <u>4</u>

32. Checking an answer to a problem by going back over it.

- |    |                   |                  |           |                  |                         |    |          |
|----|-------------------|------------------|-----------|------------------|-------------------------|----|----------|
| a. | very<br>important | <u>important</u> | undecided | not<br>important | not at all<br>important | 20 | <u>2</u> |
| b. | very easy         | <u>easy</u>      | undecided | hard             | very hard               | 21 | <u>2</u> |
| c. | like a lot        | <u>like</u>      | undecided | dislike          | dislike a lot           | 22 | <u>2</u> |

33. Memorizing rules and formulae.

- |    |                   |           |           |                          |                         |    |          |
|----|-------------------|-----------|-----------|--------------------------|-------------------------|----|----------|
| a. | very<br>important | important | undecided | <u>not<br/>important</u> | not at all<br>important | 23 | <u>4</u> |
| b. | very easy         | easy      | undecided | <u>hard</u>              | very hard               | 24 | <u>4</u> |
| c. | like a lot        | like      | undecided | <u>dislike</u>           | dislike a lot           | 25 | <u>4</u> |

34. Solving word problems.

- |    |                   |                  |           |                  |                         |    |          |
|----|-------------------|------------------|-----------|------------------|-------------------------|----|----------|
| a. | very<br>important | <u>important</u> | undecided | not<br>important | not at all<br>important | 26 | <u>2</u> |
| b. | very easy         | <u>easy</u>      | undecided | hard             | very hard               | 27 | <u>2</u> |
| c. | like a lot        | <u>like</u>      | undecided | dislike          | dislike a lot           | 28 | <u>2</u> |

35. Estimating answers to problems.

- |    |            |                  |                  |                  |                         |    |          |
|----|------------|------------------|------------------|------------------|-------------------------|----|----------|
| a. | very       | <u>important</u> | undecided        | not<br>important | not at all<br>important | 29 | <u>2</u> |
| b. | very easy  | easy             | <u>undecided</u> | hard             | very hard               | 30 | <u>3</u> |
| c. | like a lot | like             | <u>undecided</u> | dislike          | dislike a lot           | 31 | <u>3</u> |

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Decide the extent of the agreement between the feeling expressed in each statement and your own personal feelings. Circle the response you choose.

36. Mathematics will change rapidly in the near future.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

32

2

37. Mathematics is a good field for creative people.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

33

4

38. There is little place for originality in solving mathematics problems.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

34

2

39. New discoveries in mathematics are constantly being made.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

35

4

40. Mathematics helps one to think according to strict rules.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

36

4

41. Estimating is an important mathematics skill.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

37

4

42. There are many different ways to solve most mathematics problems.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

38

4

43. Learning mathematics involves mostly memorizing.

strongly  
disagree

disagree

undecided

agree

strongly  
agree

39

2



- |   |                          |                 |           |              |                |    |          |
|---|--------------------------|-----------------|-----------|--------------|----------------|----|----------|
| 44. In mathematics, problems can be solved without using rules.             | strongly disagree        | <u>disagree</u> | undecided | agree        | strongly agree | 40 | <u>2</u> |
| 45. Trial and error can often be used to solve a mathematics problem.       | <u>strongly disagree</u> | disagree        | undecided | agree        | strongly agree | 41 | <u>1</u> |
| 46. There is always a rule to follow in solving a mathematics problem.      | strongly disagree        | disagree        | undecided | <u>agree</u> | strongly agree | 42 | <u>4</u> |
| 47. There have not been any new discoveries in mathematics for a long time. | strongly disagree        | <u>disagree</u> | undecided | agree        | strongly agree | 43 | <u>2</u> |
| 48. Mathematics is a set of rules.  | strongly disagree        | <u>disagree</u> | undecided | agree        | strongly agree | 44 | <u>2</u> |
| 49. A mathematics problem can always be solved in different ways.           | strongly disagree        | disagree        | undecided | <u>agree</u> | strongly agree | 45 | <u>4</u> |
| 50. Mathematics helps one to think logically.                               | strongly disagree        | disagree        | undecided | <u>agree</u> | strongly agree | 46 | <u>4</u> |





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